2015 USER MANUAL
TRANSIT RACKS

U.S. patented and other patents pending

CONTENTS

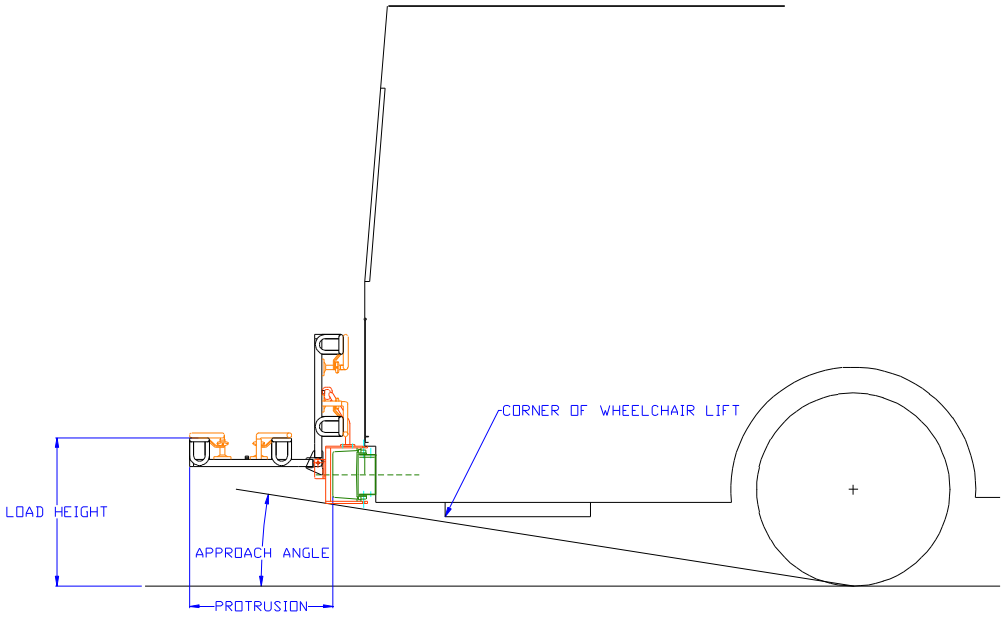
Installation - Overview

The installation is crucial to the safety and performance of the Sportworks Bike-Rack-for-Buses system. There are several factors that need to be addressed when mounting the rack. These factors include the:

- Load Height
- Approach Angle
- Footprint
- Protrusion

Carefully read and understand the following information regarding the positioning of the rack on the bus before beginning the installation process.

Load Height
The load height is the vertical distance a bicycle must be lifted for placement in a deployed bike rack. If the rack is mounted too high, some riders may have difficulty loading the rack.

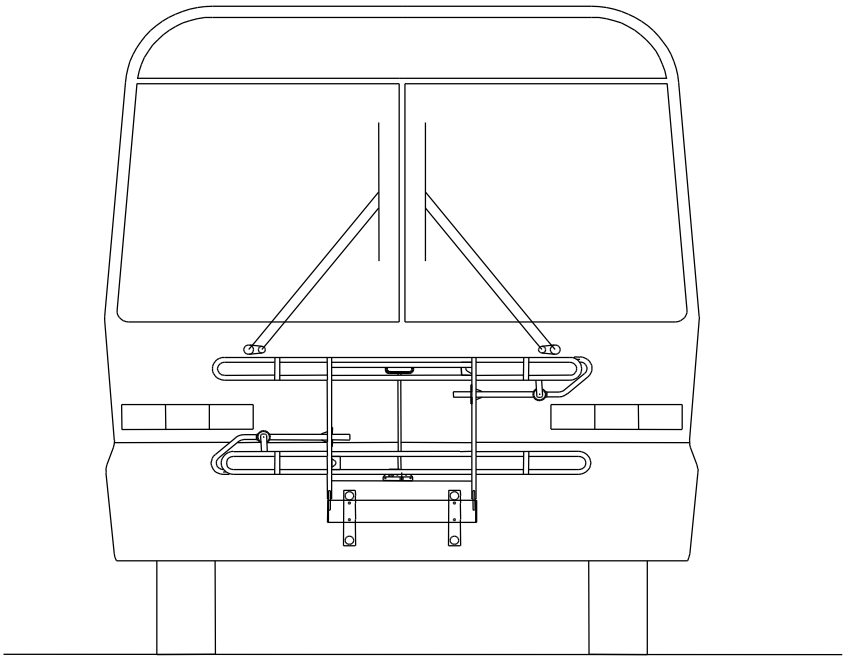


Installation **Fig. 1**

Approach Angle
The approach angle is the angle created by a line from where the front tire contacts the pavement to the first obstruction ahead of the front tire. This obstruction would first

touch the pavement on a very steep hill. The bike rack will limit the approach angle if it is installed on the bumper in a low enough position. The bike rack installer should be aware of this possibility. Investigate approach angle requirements in your area before mounting the rack.

Footprint
The footprint is the outline of a bike rack against the front of the bus when the rack is in the stored position.



Installation Fig. 2

Avoid obstructing headlights, hi-beam headlights and turn signal indicators. See the section **CHANGING THE POSITION OF THE RACK** in this chapter for adjusting the footprint of the rack.

Protrusion
Protrusion measures the distance from the front of the bumper to the front edge of the bike rack in the deployed position. Once the bike rack is mounted to the coach, the protrusion distance is fixed. Protrusion is a measurement that needs attention for three important reasons.

1) Many state DOTs (Departments of Transportation) have set limits for bike rack protrusion (e.g. California has a set limit of 36 inches).

2) The further a rack protrudes, the more likely it will affect a coach's approach angle and turning radius.

3) The rack protrusion affects the stowed position of the rack up against the front face of the coach where interference with windshield wipers and a coach driver's visual field should be avoided.

Installation Kits-

Sportworks Northwest, Inc. offers for purchase installation kits for a number of bumper installations. These include the necessary supplies for an accurate and efficient bracket installation.

These kits include but are not limited to the following items:

1. Hole Saw bit for bumper module modification.
2. Drill bit extension and arbor for bumper back-structure drilling.
3. Easy to use, reusable drill template for easy hole location.

If you have this bracket…	**Use this installation kit.**
100241	**100268 –** Install Kit RTS
100495, 100531, 100665	**100269 –** Install Kit Slide In C Frame
100243, 100374, 100646	**100270 –** Install Kit Slide In Stand Off
100242	**100271 –** Install Kit Intermediate
100242, 100406	**100272 –** Install Kit Swept Intermediate
100245, 100244	**100273 –** Install Kit GMC New Look
100246	**100274 –** Install Kit Blue Bird TC/CS
100361	**100363 –** Install Kit Blue Bird-Q
100242, 100406	**100378 –** Install Kit Swept Intermediate Vented
100447	**100449 –** Install Kit Neoplan LF, Swept Bumper
100499	**100484 –** Install Kit MCI Drop down bumper
100407, 100646	**100506 –** Install Kit Transpec
100492	**100566 –** Install Kit Slide In Neoplan Metroliner
100514, 100629, 100657	**100578 –** Install Kit Slide In Stand Off Orion VII Swept
100607	**100613 –** Install Kit 102 Swept Transit Bumper
100647, 100758	**100723 –** Install Kit Slide In 20.94 Spacing
100759	**100760 –** Install Kit Chevy G3500

***If you have a bracket that is not listed above, there is not currently an installation kit available. For most bracket installations, templates and specialized tools are not required.

Please contact Sportworks Northwest, Inc. should you have specific questions about your installation. We are happy to assist in any way possible.

Bracket Mounting

The Sportworks Bike-Rack-for-Buses system consists of two separate but integrated devices. The bike rack is the main piece to this pairing. The bracket, which secures the rack to the bus, is the other piece to this pairing. Both contribute to the safe and correct function of the rack.

The bracket system typically attaches to the existing bumper. The brackets are designed to mount to specific parts of the bumper but may also be required to attach to the coach as well. Carefully follow all mounting instructions for the type of bumper you are working with.

Before installing any bumper bracket, inspect the front of the coach for the following conditions.

1) Is the bumper mounted correctly?

2) Are the bumper and the frame of the bus in good repair? Check to ensure that they are not bent or twisted from collision or from damage incurred during towing.

3) Is the bus free of any other device that will inhibit the function of the bus or the rack?

4) If the bumper must be removed to install the rack, it is up to the installer to determine if the bumper to bus bolts can be re-used. Please examine all fasteners carefully and proceed in a workmanlike fashion.

If the answer is "NO" to any of these questions, repair the bus or the bumper before mounting the bracket to the bus. Mounting a bracket without making these requested repairs, especially modifying a bracket to fit on a bus that is damaged, voids all Sportworks warranties and creates potentially unsafe conditions.

HELP UNIVERSAL 96" and 102" BUMPERS

The "96" denotes bus width in inches as does the "102".

The Help Universal 96”/102” bumper can be identified by an array of exposed bolts on the top and bottom of the bumper. These bolts hold the bumper’s three black urethane pieces to the bumper back structure. The Sportworks mounting bracket (C-Brackets) is intended to mount to the bumper at four of the existing bolt locations.

Typically, no modifications to a coach with the Universal 96" or 102" bumper are required to install the Sportworks bracket and bike rack. However, clearance problems may be encountered with each C-Bracket arm and its mounting hardware fitting between the bumper and the coach body. Check this clearance before installing a bracket and bike rack.

Caution: Before proceeding with the bracket and bike rack installation, check that each C-Bracket arm and its mounting hardware has enough clearance to fit between the bumper and the coach body.

If there is a clearance problem, either:

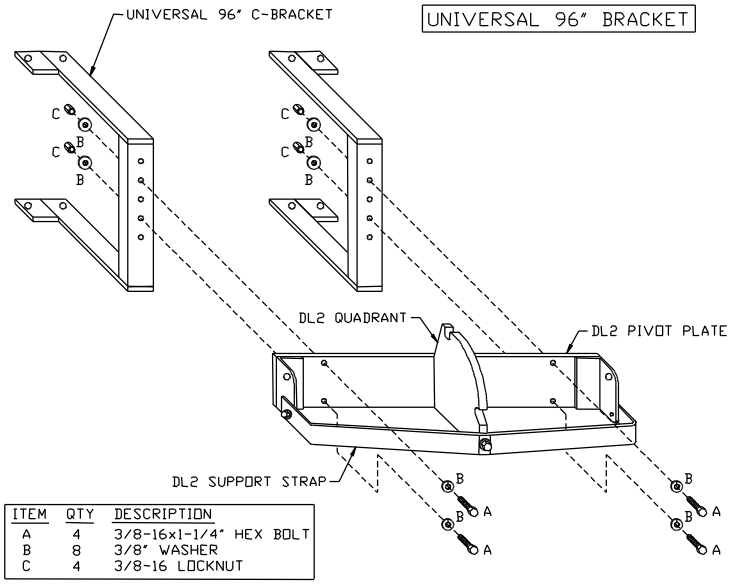
1) Modify the body of the coach as required to fit the C-Brackets and its hardware or

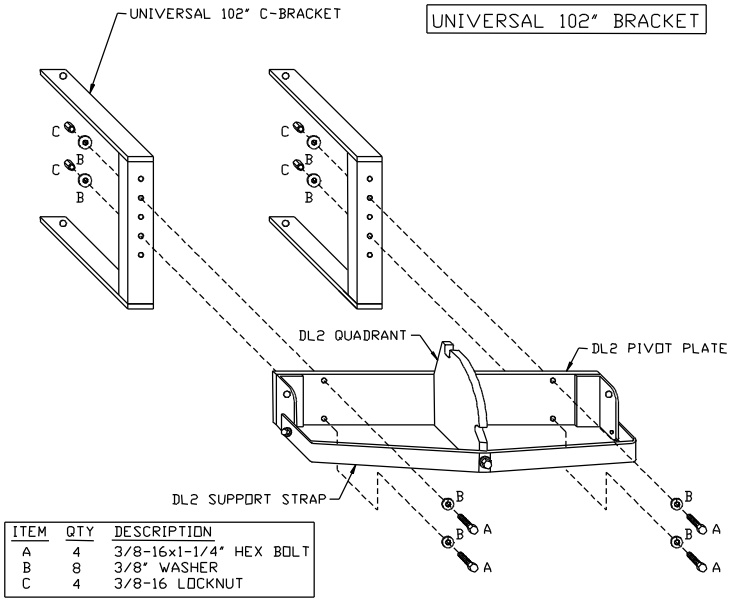
2) Re-mount the bumper low enough to achieve necessary clearance.

BIKE RACK INSTALLATION TO HELP UNIVERSAL 96"/102" BUMPER

Follow the installation instructions below to install a Sportworks bike rack to a coach with a Universal 96” or 102” bumper. Make sure you are installing the correct bracket on the bus. Unlike the 102" C-Brackets, the 96" C-Brackets have welded "ear" tabs on the ends of the C-Bracket arms.

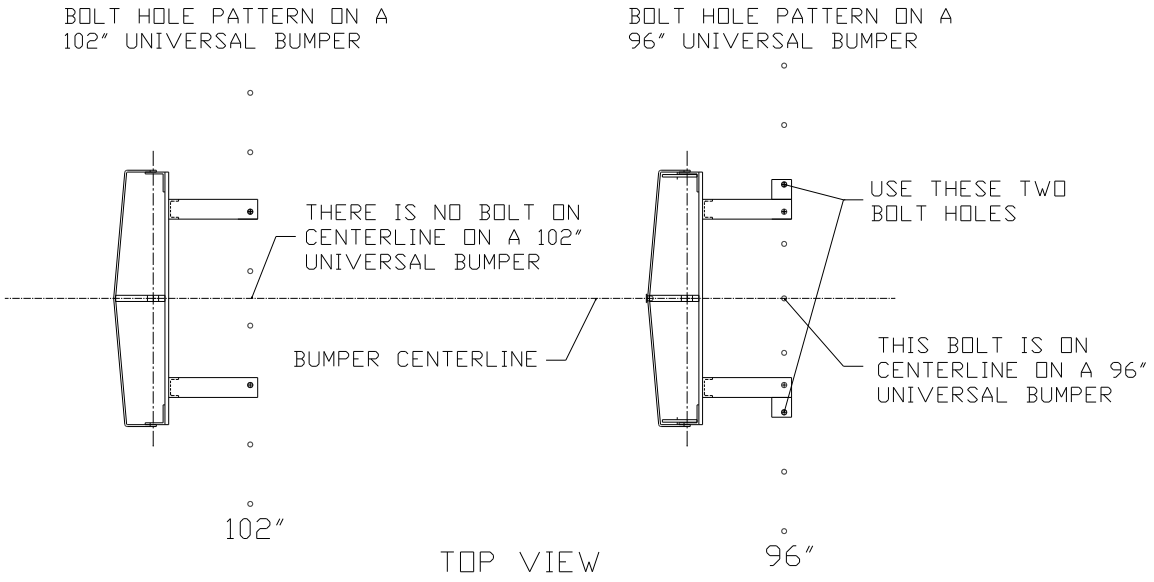
1. Orient the pivot plate assembly and C-Brackets as shown below and loosely assemble together. See Figure 3. This assembly is the mounting bracket.





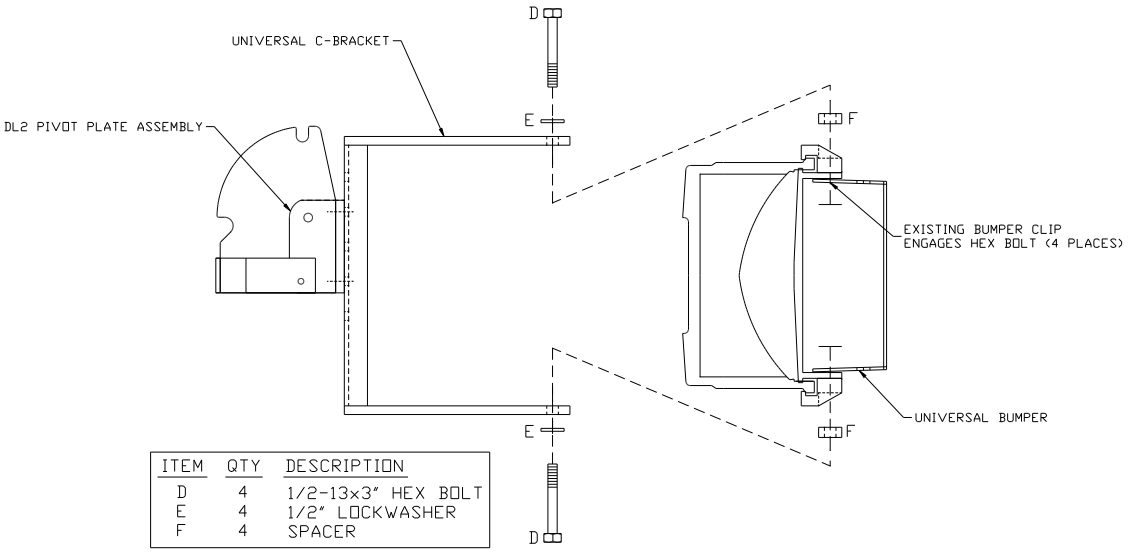
Installation **Fig. 3**

2. Identify the locations of the four existing bolts on the bumper--two on the top and two on the bottom of the bumper--which will be used in attaching the mounting bracket to the bumper. Remove these four bolts. See Figure 4.



Installation Fig. 4

3. Attach the mounting bracket to the bumper using 1/2-13x3" hex bolts, lockwashers and spacers. See Figure 5.



Installation Fig. 5

4. Tighten all mounting bracket fasteners after correctly seating the mounting bracket on the front bumper. The mounting bracket is now installed.

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

HELP SLIDE-IN BUMPERS

The Help Slide-In bumper can be identified by its aluminum extruded back structure and its 2 black urethane pieces that “slide-in” onto the back structure and meet at the bumper centerline.

There are two different methods of installing a Sportworks bike rack to coaches with a Slide-In bumper. The method depends on the type of mounting bracket you choose--either the C-Bracket or Stand-off mounting bracket. The Stand-off mounting bracket is ideal for buses with minimal clearance between the top of the Slide-In bumper and coach body.

SLIDE-IN BUMPER--C-BRACKET METHOD

The C-Bracket mounting bracket is intended to mount to the extruded back structure of the Slide-In bumper at four locations--two at the top and two at the bottom of the bumper.

No modifications to a coach with a Slide-In bumper are typically required to install the Sportworks C-Bracket and bike rack. However, clearance problems may be encountered with each C-Bracket arm and its mounting hardware fitting between the bumper and the coach body. Check this clearance before installing a bracket and bike rack.

Caution: Before proceeding with the bracket and bike rack installation, check that each C-Bracket arm and its mounting hardware has enough clearance to fit between the bumper and the coach body.

If there is a clearance problem, either:

1) Modify the body of the coach as required to fit the C-Brackets and its hardware or

2) Re-mount the bumper low enough to achieve necessary clearance.

C-BRACKET METHOD
BIKE RACK INSTALLATION TO HELP SLIDE-IN BUMPER

1. Using the aluminum bumper back structure as the reference, mark the bumper centerline on the top and bottom surface of the aluminum bumper back structure as well as on the front face of the coach. The centerline mark on the top of the bumper and on the front face of the coach should mate. These two centerline marks will help in re-aligning the bumper to the coach later.

2. Remove the Slide-In bumper from the coach frame by unfastening the bumper-to-frame bolts.

3. Place and firmly hold the provided transfer punch template on the top surface of the bumper back structure with the template centerline aligned with the bumper centerline and the template dowels contacting the TOP REAR edge of the back structure. The words "BUMPER PUNCH" should be visible. Transfer punch two holes, one on each side of the centerline. See Figure 6.

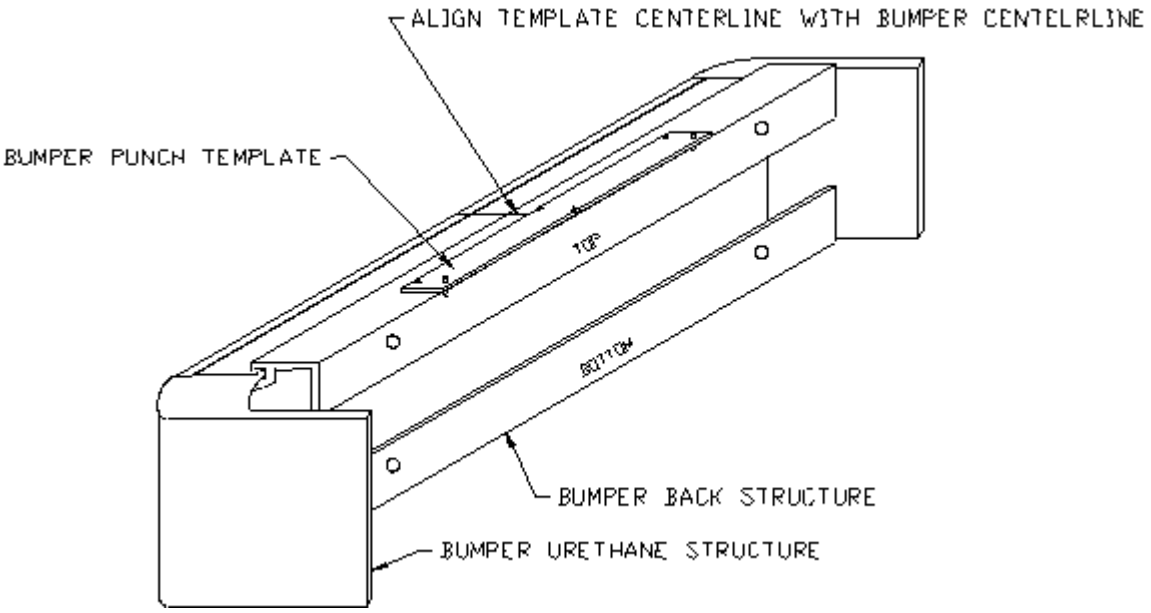


Figure 6

4. Mark two holes on the BOTTOM of the bumper back structure using the same procedure of step 3.

5. Drill a 1/4" hole through each mark produced in step 3 and 4 (drill 4 holes total). Next, enlarge the 1/4" holes with a 17/32" drill. Drill perpendicular to the bumper surface.

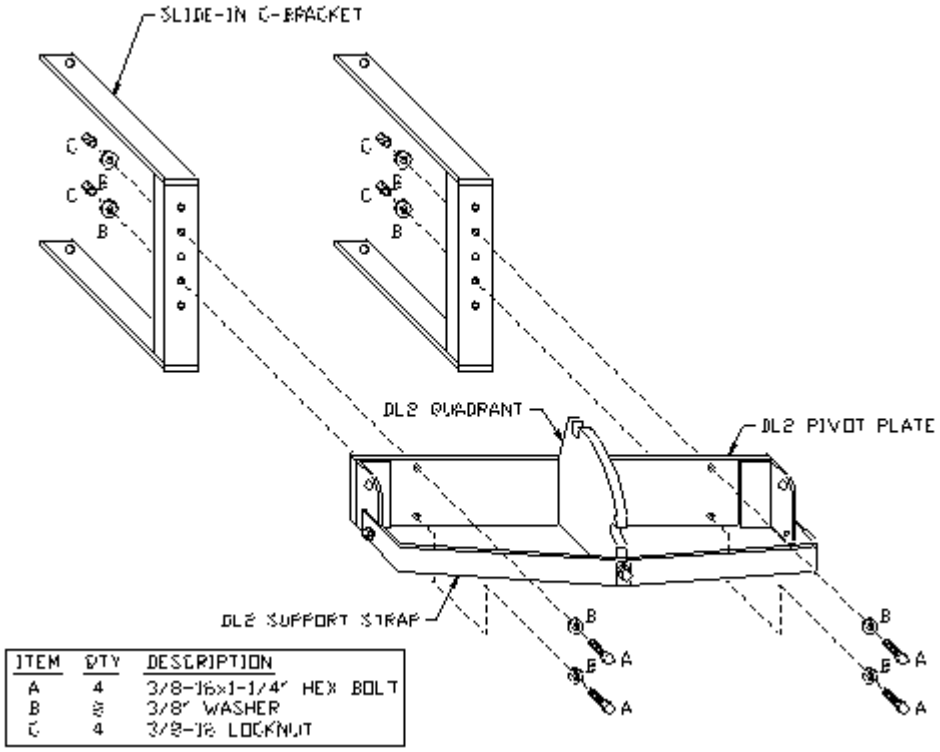


Figure 7

6. Orient the pivot plate assembly and C-Brackets as shown below and loosely assemble together. See Figure 7. This assembly is the mounting bracket.

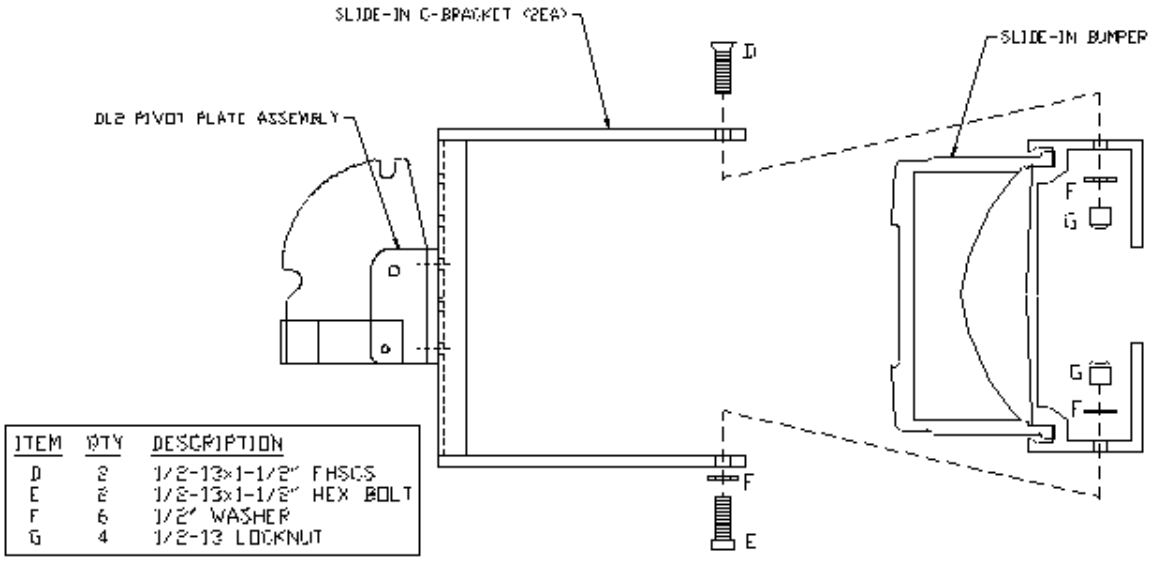


Figure 8

7. Assemble the mounting bracket to the bumper back structure at 4 places using 1/2 x 1-1/2" bolts, washers, and locknuts. Tighten any loose bolts of the mounting bracket.

8. Remount the bumper with the attached mounting bracket to the coach frame. Tighten all bumper-to-frame bolts after the bumper has been adjusted level to the coach body and the centerlines marked in step 1 mate back together. (**NOTE:** Placing spacers between the top of the bumper back structure and the coach body makes positioning of the bumper easier).

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

INSTALLATION KIT
Install to Slide-In Bumper via C-Brackets

1.	1 each	Rigid transfer punch template
2.	1 each	1/4" transfer punch
3.	1 each	1/4" drill
4.	1 each	17/32" drill

SLIDE-IN BUMPER--STAND-OFF METHOD

The Stand-off mounting bracket mounts to the front of the Slide-In bumper via four holes sawn through the urethane structure and four corresponding holes drilled through the bumper back structure. This method is ideal for buses with minimum clearance between the top of the Slide-In bumper and coach body.

No modifications to a coach with a Slide-In bumper are typically required to install the Sportworks Stand-off bracket and bike rack.

STAND-OFF METHOD
BIKE RACK INSTALLATION TO HELP SLIDE-IN BUMPER

If you are installing a Sportworks bike rack to a coach equipped with a wheelchair lift, you may have to deploy the lift and remove the wheelchair lift pan cover in order to gain clearance for installation. You may also have to remove the bumper from the coach to gain bolt access.

1. Locate the provided drill jig template on the bumper. Align each semi-cylinder piece of the drill template against the curved profile of the front bumper face. The template should be well indexed. Match the center of the template with the center of the front of the bus. Hold or tape the template firmly in position. See Figure 9.

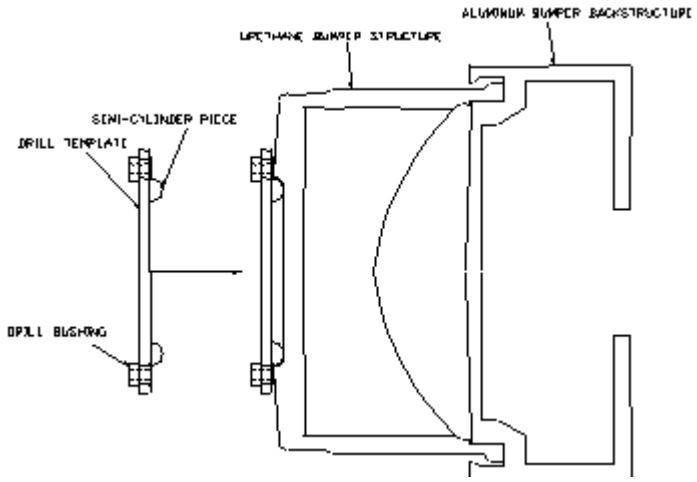


Figure 9

2. Using a 1/4" pilot drill, drill through ONLY ONE of the upper template bushings just through the urethane bumper. Insert a 1/4" dowel into the drilled hole to index the template in place. Drill a 1/4" hole through the other upper bushing and insert a 1/4" dowel into it. With the template indexed to the bumper at two places, drill the two lower 1/4" holes on each side of the bumper (4 holes total). The template must not move during this step!

3. Remove the template from the bumper. Use a 1-1/2" hole saw with a 1/4" pilot drill to saw four holes just through the front surface of the urethane bumper at the same four locations drilled in step 2. Use care to ensure that the holes are sawn perpendicular to the front bumper surface. If you encounter a urethane rib, continue to saw through the rib until a pathway to the bumper back structure is produced.

4. Insert on each side of the bumper a stand-off into the holes sawn in step 3. Orient the five 3/8" holes of the stand-offs "INBOARD" towards the bumper centerline. Work each stand-off into the 1-1/2" holes until the stand-off legs contact the aluminum extruded back structure of the bumper. The friction fit of the stand-off legs in the bumper holes should hold them in place.

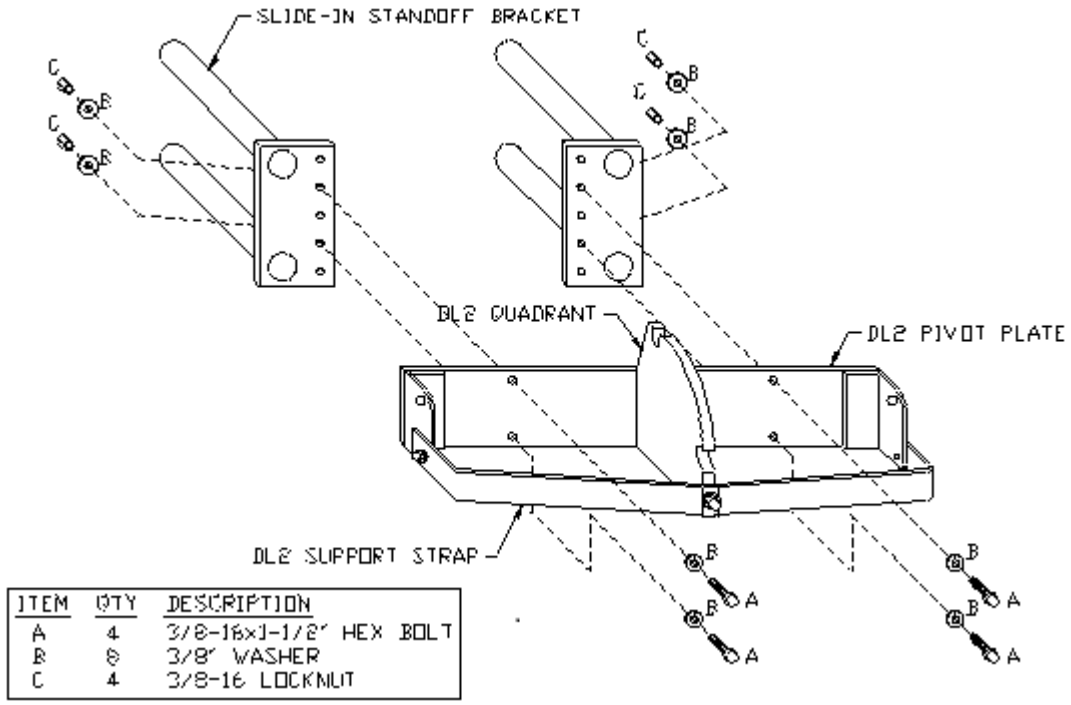


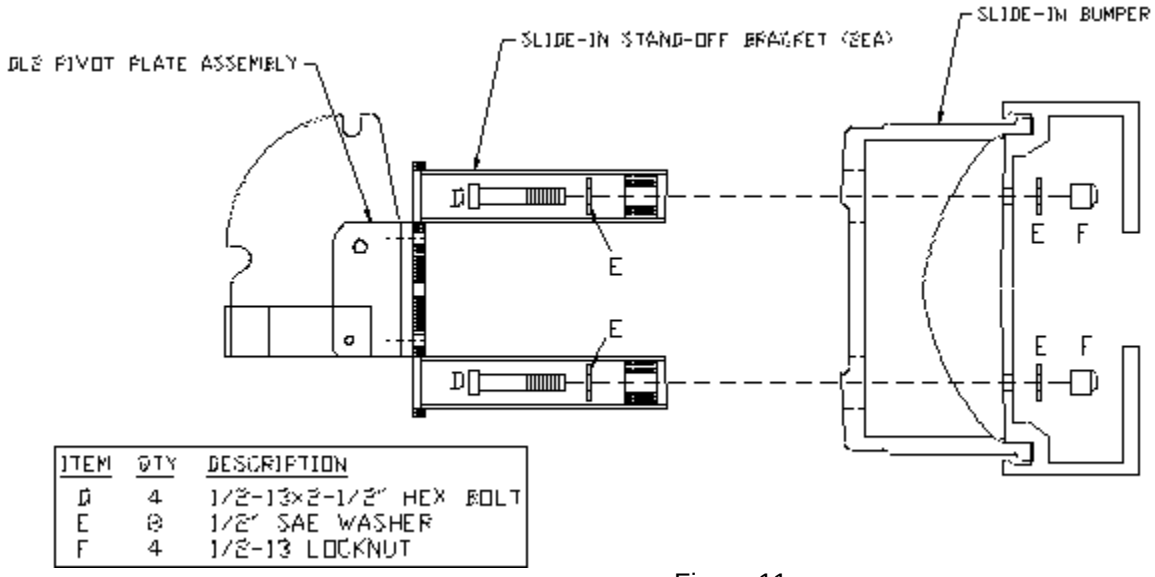
Figure 10

5. Orient the pivot plate assembly with the pivot holes “UP” and fasten it to the two stand-offs at the middle height adjustment using 3/8" x 1-1/2" bolts, washers and locknuts. See Figure 10. This assembly is the mounting bracket.

6. Using a 1/2" extra long drill and using each stand-off as a drill jig, drill through the bumper back structure at four locations--two locations per stand-off--by inserting the drill down into each stand-off leg. Use cutting oil/lubricant on the tip of the drill. Clear any chips from the drilling operation.

7. Assemble each stand-off to the bumper back structure using 1/2" x 2-1/2" bolts, washers, and locknuts. Use a socket wrench with an extension to insert and tighten the bolts inside each stand-off leg. Protect the bolt access path of each stand-off leg by inserting a plastic cap into each leg. Now you may conveniently adjust the

loading height of the bike rack by moving the pivot plate to a higher or lower position if desired. The mounting bracket is now installed.



ITEM	QTY	DESCRIPTION
D	4	1/2-13x2-1/2" HEX BOLT
E	8	1/2" SAE WASHER
F	4	1/2-13 LOCKNUT

Figure 11

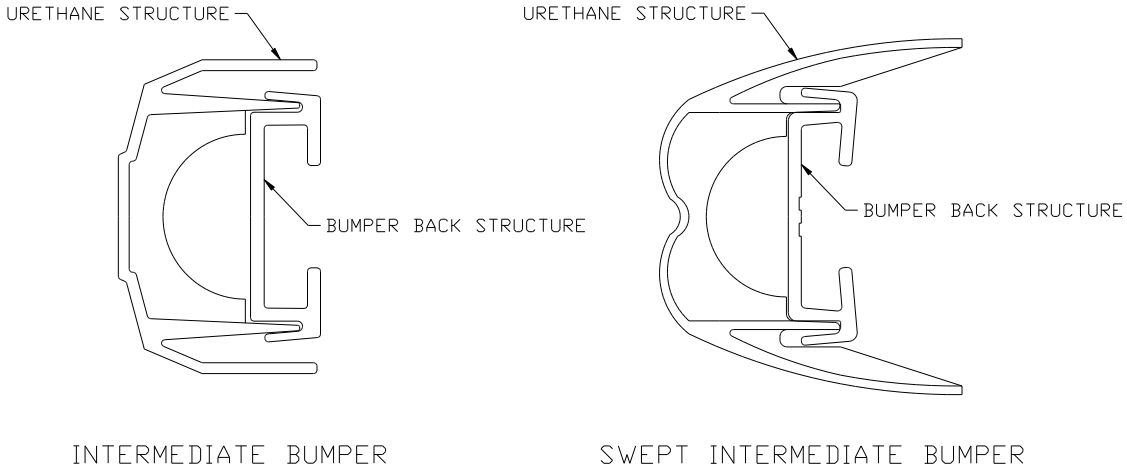
You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

INSTALLATION KIT
Install to Slide-In Bumper via Stand-off Brackets

1.	1 each	Drill jig template
2.	2 each	1/4" indexing dowel to secure the drill jig template
3.	1 each	Hole saw arbor with 1/4" pilot drill
4.	1 each	1-1/2" hole saw
5.	1 each	1/2" extension drill, 12" length

HELP INTERMEDIATE BUMPERS

The INTERMEDIATE and SWEPT INTERMEDIATE bumpers are similar bumpers. The Swept Intermediate bumper is just a later version of the Intermediate bumper with characteristic smooth, rounded curves.



Installation Fig. 12

The method of bike rack installation and type of mounting bracket are the same for both the Intermediate and Swept Intermediate bumper. A bracket set consisting of two "stand-offs" is inserted into the front face of each bumper via four holes sawn through the urethane bumper structure and four corresponding holes drilled through the bumper back structure. Bolts secure each stand-off to the bumper back structure.

The Intermediate and Swept Intermediate bumpers each have internal urethane "ribs" as part of the bumper structure which gives it strength and stability. The key to a smooth, successful installation of stand-off brackets is to place the stand-off legs between the urethane ribs. Placing the stand-offs 16" apart and centered to the front face of the coach (i.e. each stand-off is placed 8" on either side of the bumper centerline) typically avoids interference with the ribs.

The Intermediate bumper may be found on coaches of different widths. Different coach widths can affect the rib spacing of the urethane structure. For this reason, be sure to determine the required distance between stand-offs to clear the internal ribs of the urethane bumper structure (either 16" or 18" to be compatible with the installation jig). This rib spacing check should not be required for the Swept Intermediate bumper--stand-offs 16" apart should miss any urethane rib.

Before installing a bike rack on an INTERMEDIATE bumper:

- Check the rib spacing of the bumper for stand-off leg clearance at 16" and 18" apart and centered relative to the front face of the coach. (**NOTE:** Each stand-off leg is 1-1/2" in diameter).

- Use the 16" spacing between stand-offs for the coach, provided that the stand-off legs miss the internal ribs. Use the 18" spacing as a possible alternative to avoid ribs. The drill template clearly indicates which drill bushings to use for either the 16" or 18" spacing between stand-offs. The bike rack will easily install with either the 16" or 18" spacing.

- After the spacing between stand-offs has been established, follow the installation instructions below. The installation procedure is the same for either the 16" or 18" spacing. The only difference is which set of drill template bushing holes to drill through (16" or 18").

- Consult Sportworks at (425) 483-7000 if neither the 16" or 18" spacing will work for your application.

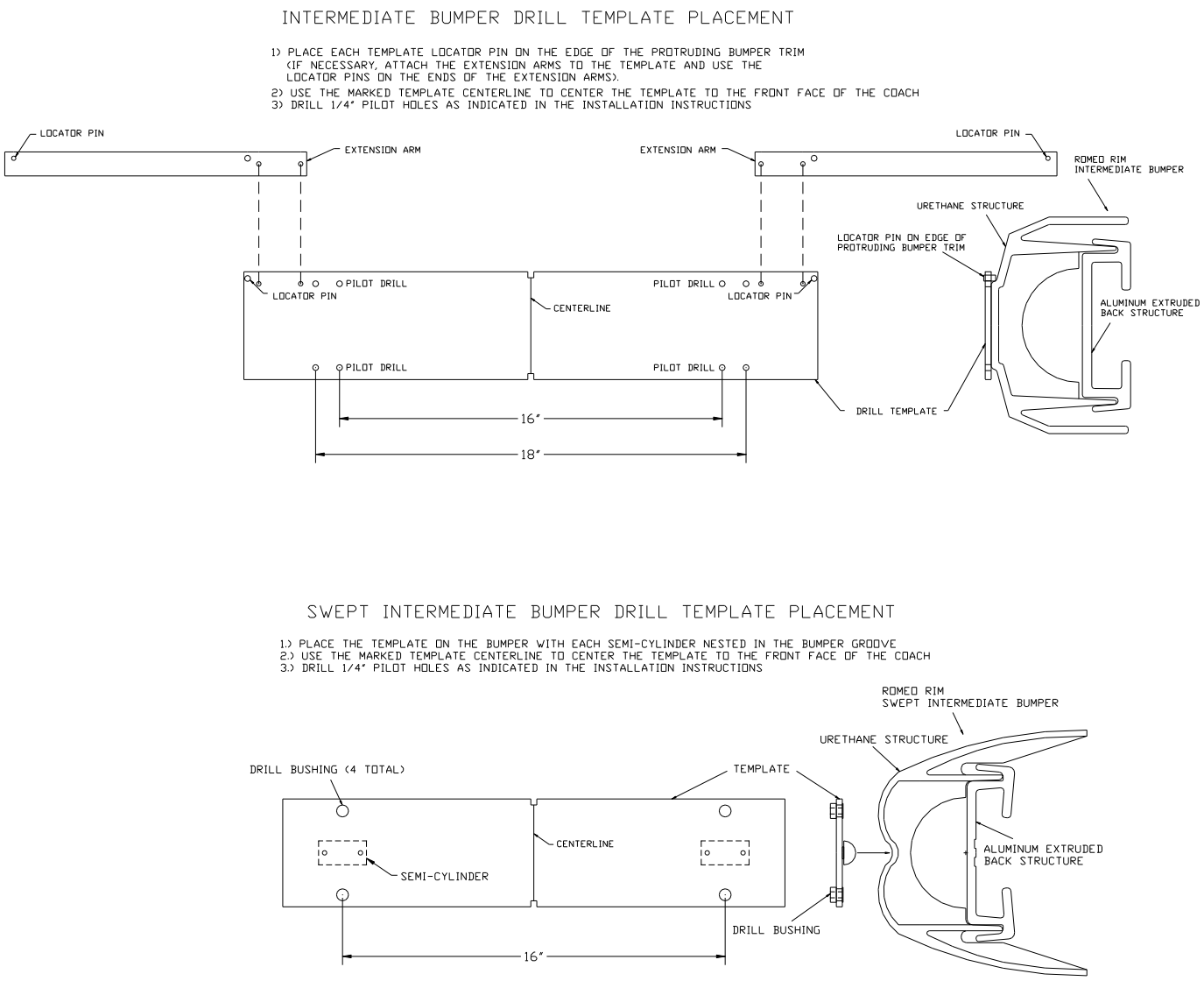
BIKE RACK INSTALLATION TO
INTERMEDIATE/SWEPT INTERMEDIATE BUMPER

1. Locate the drill jig template on the bumper.

   Intermediate Bumper
   Align each locator pin of the template on the TOP edge of the protruding bumper trim. Match the center of the template with the center of the front of the bus. Hold or tape the template firmly in position. See Figure 13.

   Swept Intermediate Bumper
   Place each semi-cylinder piece of the template into the bumper groove. Match the center of the template with the center of the front of the bus. Hold or tape the template firmly in position. See Figure 13.

2. Using a 1/4" pilot drill, drill through ONLY ONE of the upper template bushings just through the urethane bumper. Insert a 1/4" dowel into the drilled hole to index the template in place. Drill a 1/4" hole through the other upper bushing and insert a 1/4" dowel into it. With the template indexed to the bumper at two places, drill the two lower 1/4" holes on each side of the bumper (4 holes total). The template must not move during this step!



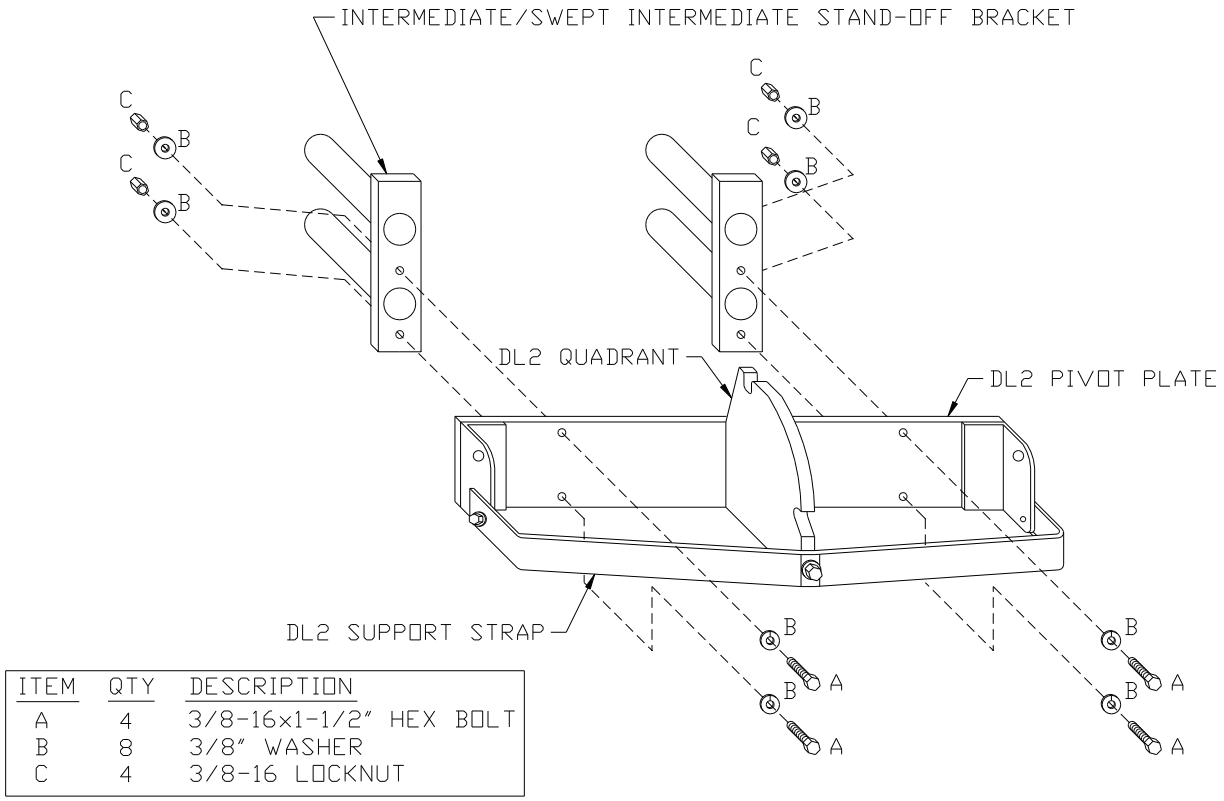
Installation Fig. 13

3. Remove the template from the bumper. Use a 1-1/2" hole saw with a 1/4" pilot drill to saw four holes just through the front surface of the urethane bumper at the same four locations drilled in step 2. Use care to insure that the holes are sawn perpendicular to the surface of the bumper back structure.

4. Insert on each side of the bumper a stand-off into the holes sawn in step 3. Orient the 3/8" holes of the stand-offs "DOWN" for a lower bicycle loading height. Work each stand-off into the 1-1/2" holes until the stand-off legs contact the aluminum extruded back structure of the bumper. The friction fit of the stand-off legs in the bumper holes should hold them in place.

5. Assemble the pivot plate assembly to the two stand-offs using 3/8" x 1-1/2" bolts, washers and locknuts. See Figure 14. This assembly is the mounting bracket. The pivot plate assembly will be used as a drill brace for step 6.

6. Using a 1/2" extra long drill and using each stand-off as a drill jig, drill through the bumper back structure at four locations--two locations per stand-off--by inserting the drill down into each stand-off leg. Use cutting oil/lubricant on the tip of the drill. Clear any chips from the drilling operation. You will need to move and remount the pivot plate assembly to the two stand-offs as required to gain clearance to drill all 4 holes. The pivot plate assembly should be used as a drill brace in this step.

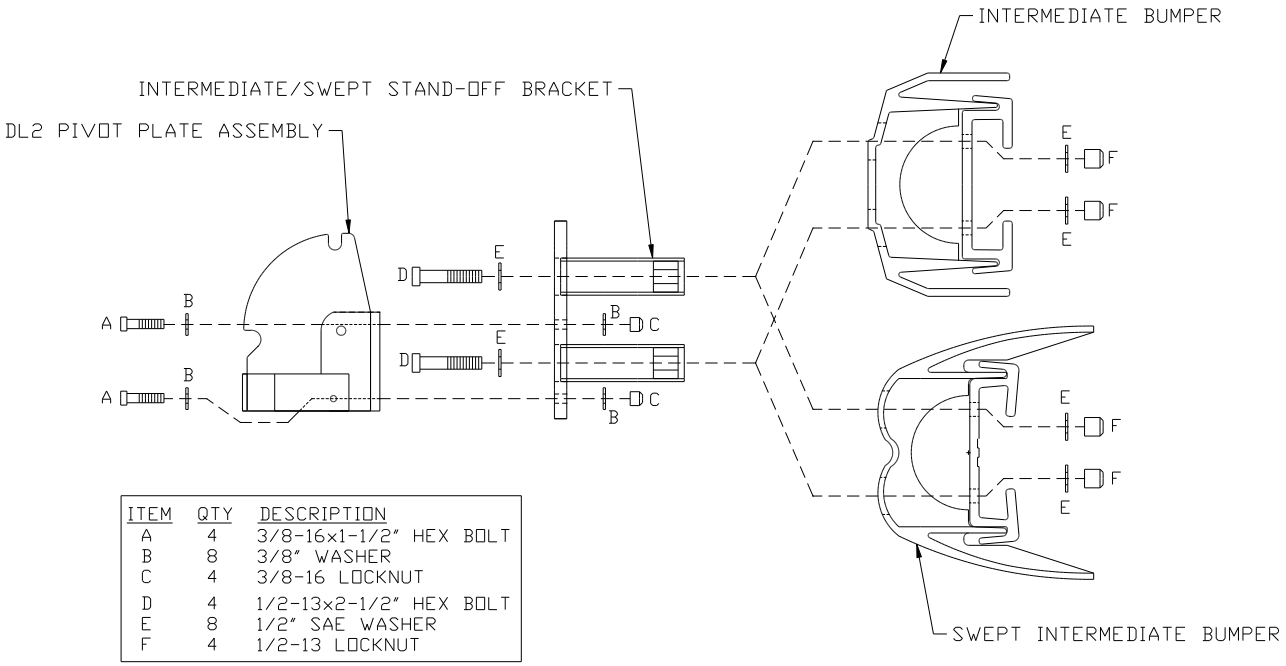


ITEM	QTY	DESCRIPTION
A	4	3/8-16x1-1/2" HEX BOLT
B	8	3/8" WASHER
C	4	3/8-16 LOCKNUT

Installation Fig. 14

7. Assemble each stand-off to the bumper back structure using 1/2" x 2-1/2" bolts, washers, and locknuts. Use a socket wrench with an extension to insert and tighten the bolts inside each stand-off leg. Protect the bolt access path of each stand-off leg by inserting a plastic cap into each leg. See Figure 15.

8. Remount the pivot plate assembly to the two stand-offs. See Figure 15. The mounting bracket is now installed.



Installation Fig. 15

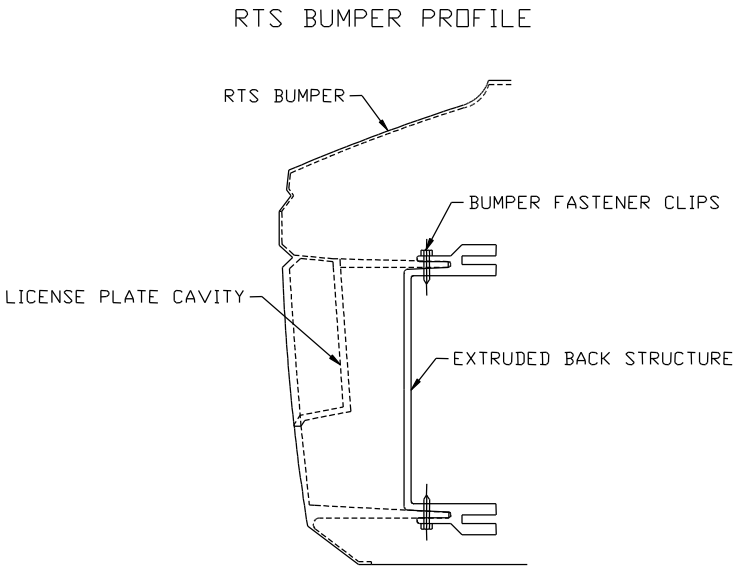
You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

INSTALLATION KIT
Install to Intermediate/Swept Intermediate Bumper via Stand-off Brackets

1.	1 each	Drill jig template
2.	2 each	1/4" indexing dowel to secure the drill jig template
3.	1 each	Hole saw arbor with 1/4" pilot drill
4.	1 each	1-1/2" hole saw
5.	1 each	1/2" extension drill, 12" length

RTS BUMPERS

The RTS bumper presents a very simple interface for the Sportworks bracket and bike rack. The method of bike rack installation is to insert a bracket set consisting of two "stand-offs" into the front face of the bumper via 1-1/2" holes sawn typically at 18" apart in the urethane bumper structure. The stand-off legs contact the aluminum extruded back structure of the bumper. Bolts hold each stand-off to the bumper back structure.



Installation Fig. 16

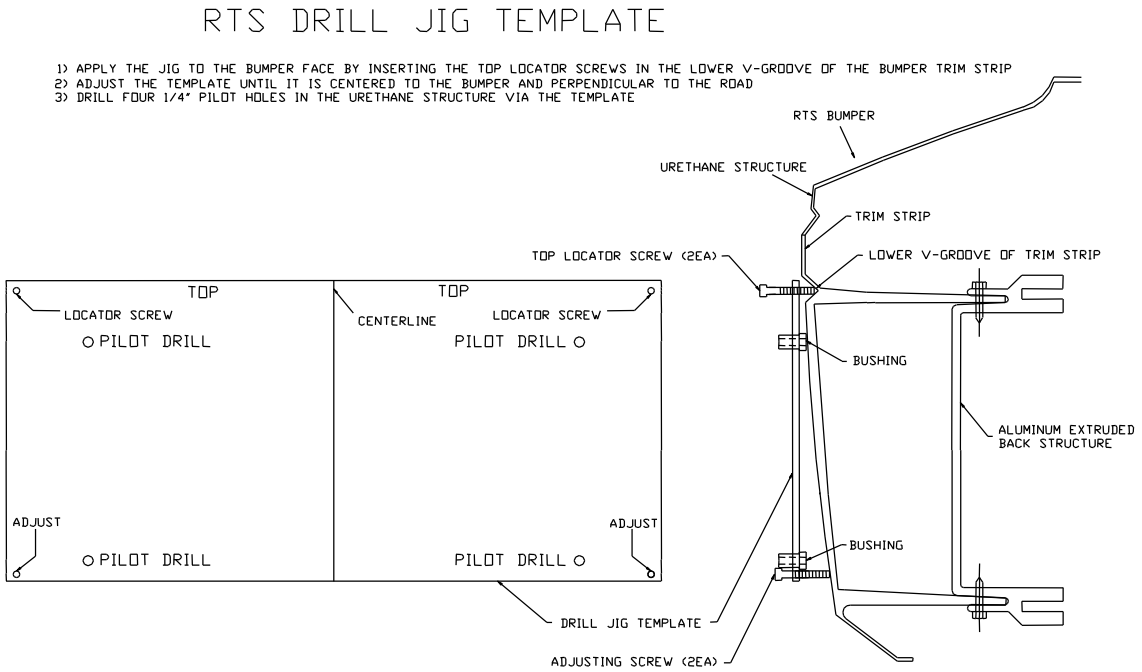
BIKE RACK INSTALLATION TO RTS BUMPER

Use the installation instructions below to install a Sportworks bike rack and mounting bracket to an RTS coach.

1. Locate and mark the center (left to right) of the RTS bumper on the black (typically black) bumper trim strip.

2. Locate the drill jig template on the bumper. Align the top two locator screws of the template in the lower V-groove of the black bumper trim strip. Make sure the locator screws touch the top and bottom of the V-groove. Match the centerline of the template with the centerline of the bumper. Turn the bottom two leveling screws (adjusting screws) by hand or with an allen wrench until the template is perpendicular to the ground and cannot rock. See Figure 17. HOLD OR TAPE THE TEMPLATE FIRMLY IN POSITION. THE TEMPLATE SHOULD NOT MOVE.

3. Using a 1/4" pilot drill, drill through ONLY ONE of the upper template bushings just through the urethane bumper. Insert a 1/4" dowel into the drilled hole to index the template in place. Drill a 1/4" hole through the other upper bushing and insert a 1/4" dowel into it. With the template indexed to the bumper at two places, drill the two lower 1/4" holes on each side of the bumper (4 holes total). The template should not move during this step!

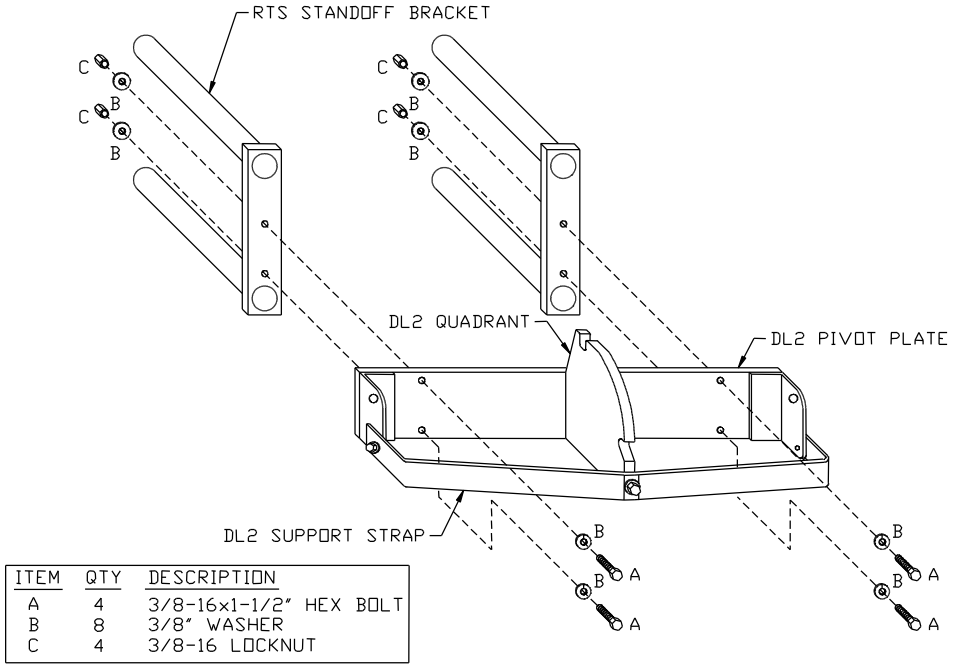


Installation Fig. 17

4. Remove the template from the bumper. Use a 1-1/2" hole saw with a 1/4" pilot drill to saw four holes just through the front surface of the urethane bumper at the same four locations drilled in step 3. Use care to insure that the holes are sawn perpendicular to the surface of the bumper back structure.

5. Insert on each side of the bumper a stand-off into the holes sawn in step 4. Orient the 3/8" holes of the stand-offs "DOWN" for a lower bicycle loading height. Work each stand-off into the 1-1/2" holes until the stand-off legs contact the aluminum extruded back structure of the bumper. The friction fit of the stand-off legs in the bumper holes should hold them in place.

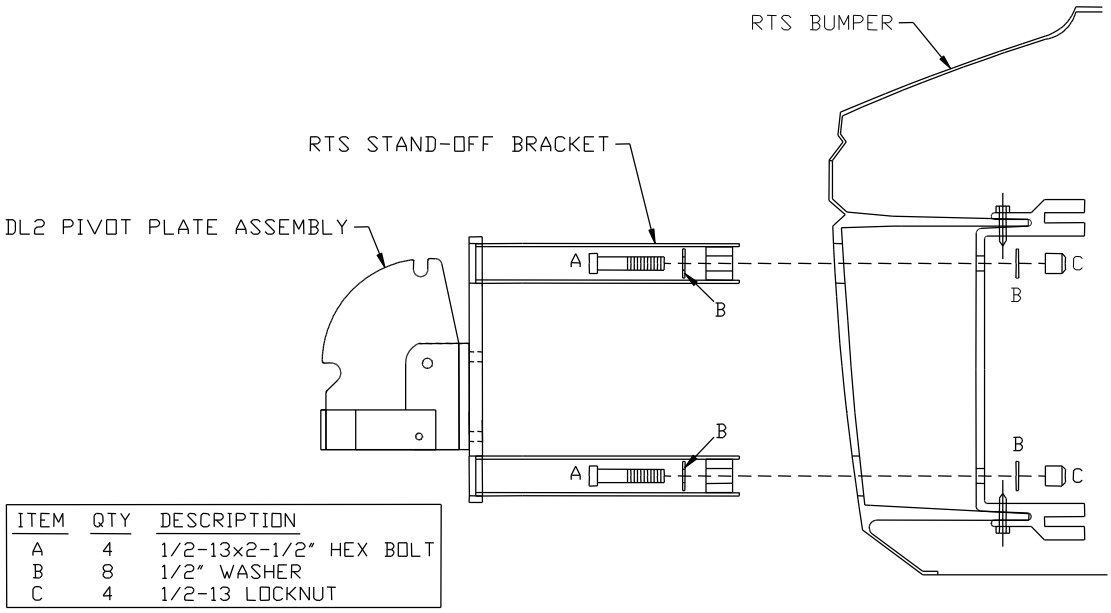
6. Orient the pivot holes of the pivot plate "UP" and "OUT" and assemble the pivot plate assembly to the two stand-offs using 3/8" x 1-1/2" bolts, washers and locknuts. This assembly is the mounting bracket. See Figure 18.



ITEM	QTY	DESCRIPTION
A	4	3/8-16x1-1/2" HEX BOLT
B	8	3/8" WASHER
C	4	3/8-16 LOCKNUT

Installation Fig. 18

7. Using a 1/2" extra long drill and using each stand-off as a drill jig, drill through the bumper back structure at four locations--two locations per stand-off--by inserting the drill down into each stand-off leg. Use cutting oil/lubricant on the tip of the drill. Clear any chips from the drilling operation.



Installation Fig. 19

8. Assemble each stand-off to the bumper back structure using 1/2" x 2-1/2" bolts, washers and locknuts. Use a socket wrench with an extension to insert and tighten the bolts inside each stand-off leg. See Figure 19. Protect the bolt access path of each stand-off leg by inserting a plastic cap into each leg. The mounting bracket is now installed.

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

INSTALLATION KIT
Install to RTS Bumper via Stand-off Brackets

1.	1 each	Drill jig template
2.	2 each	1/4" indexing dowel to secure the drill jig template
3.	1 each	Hole saw arbor with 1/4" pilot drill
4.	1 each	1-1/2" hole saw
5.	1 each	1/2" extension drill, 12" length

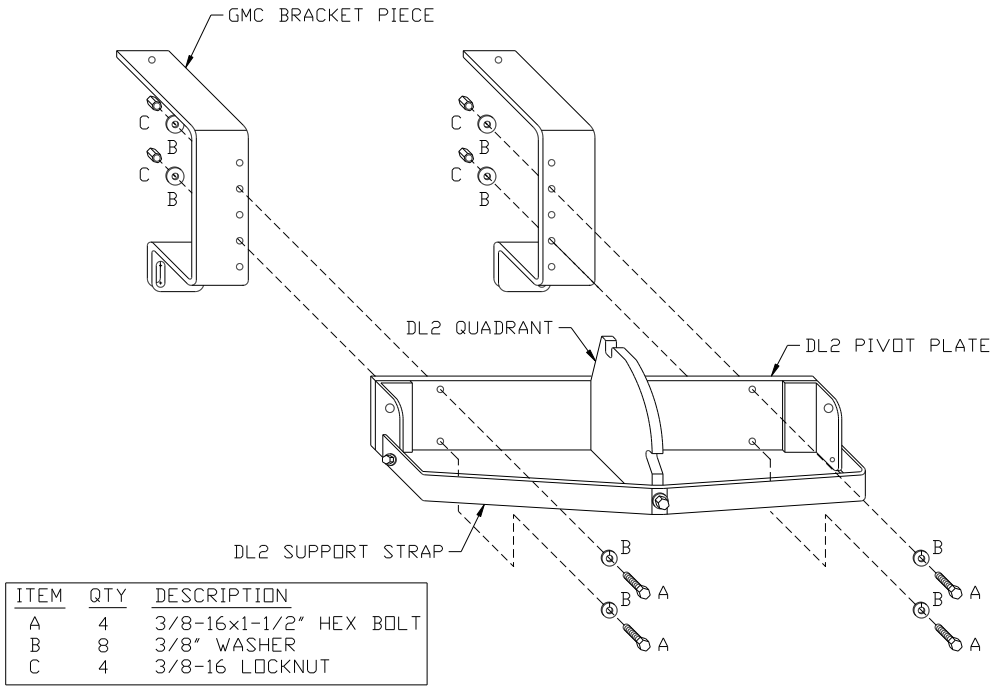
GMC NEW LOOK BUMPERS

The Sportworks bike rack easily interfaces with the GMC New Look coach. The mounting bracket consists of a bracket set and support cross-tube that bolt directly to existing bolt holes on the GMC coach. The bike rack is then fastened to the mounting bracket.

BIKE RACK INSTALLATION TO GMC NEW LOOK BUMPER

Follow the installation instructions below to install a Sportworks bike rack and mounting bracket to a GMC New Look coach.

1. Loosely assemble the pivot plate assembly to the GMC bracket pieces as shown in Figure 20. Use the provided 3/8-16x1-1/2" hex bolts, washers, and locknuts.

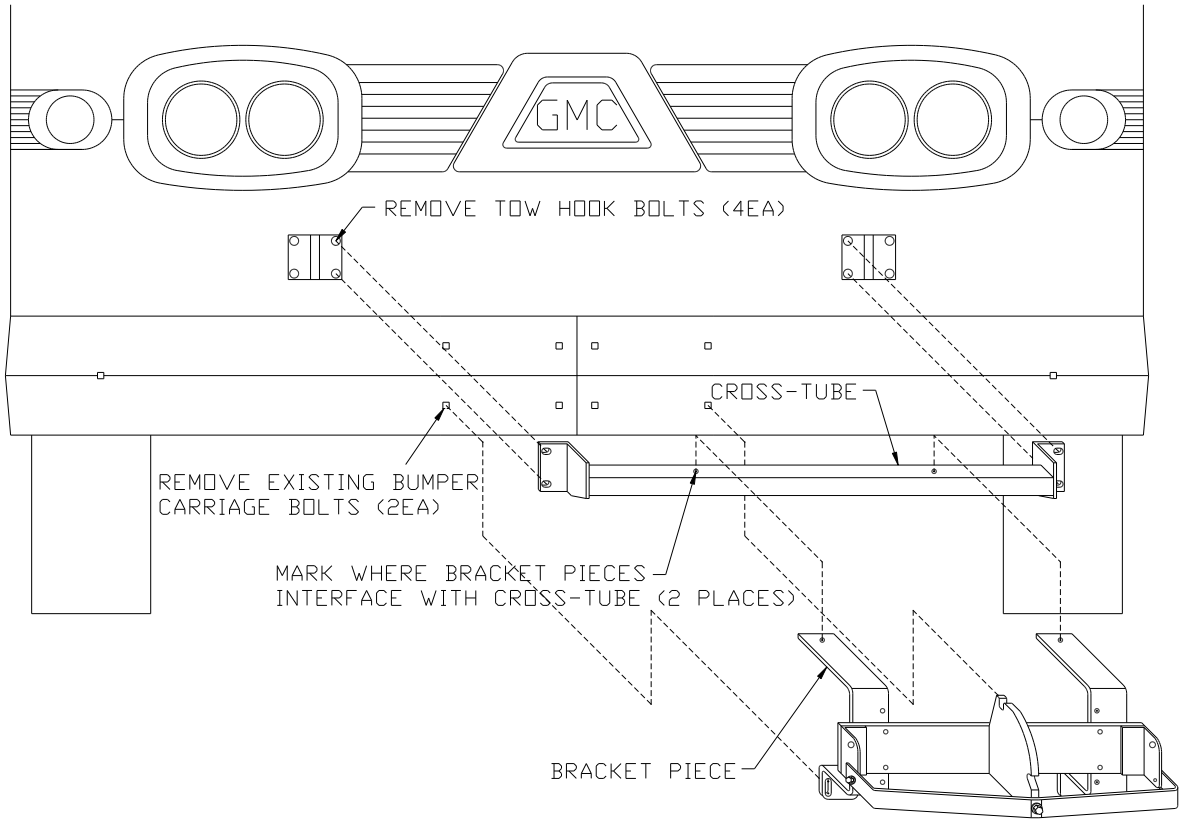


ITEM	QTY	DESCRIPTION
A	4	3/8-16x1-1/2" HEX BOLT
B	8	3/8" WASHER
C	4	3/8-16 LOCKNUT

Installation Fig. 20

2. Expose two existing bumper bolt holes on the GMC coach front bumper by removing the two carriage bolt assemblies typically centered and spaced 22" apart on the lower portion of the front bumper.

3. Examine both tow hooks on the front face of the GMC coach. Each tow hook is anchored to the coach face via four bolts. Remove the two bolts from each tow hook that are oriented "INBOARD" towards the bumper centerline.



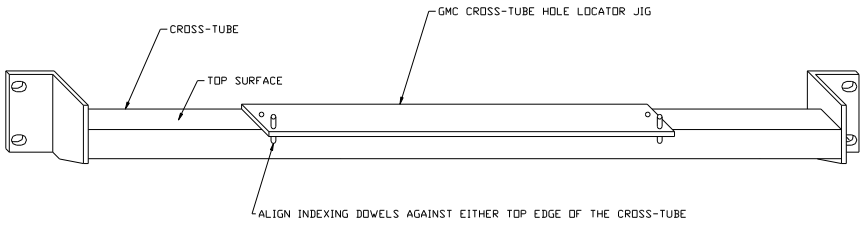
Installation Fig. 21

4. Place the assembly of step 1 and the cross-tube on the GMC coach as shown in Figure 21. Orient the notches of the cross-tube angle pieces “DOWN”. The notches provide clearance for the front bumper. Use a felt tip pen to mark on the cross-tube where the top hole of each bracket piece rests at the center width of the cross-tube. The marks should be spaced 20” apart and should clearly indicate the soon-to-be attachment point of each GMC bracket piece to the cross-tube (variations from coach to coach do not allow pre-drilled holes to be made in the cross-tube).

5. Remove the GMC bracket pieces with the pivot plate assembly from the bumper. Remove the cross-tube from the tow hooks.

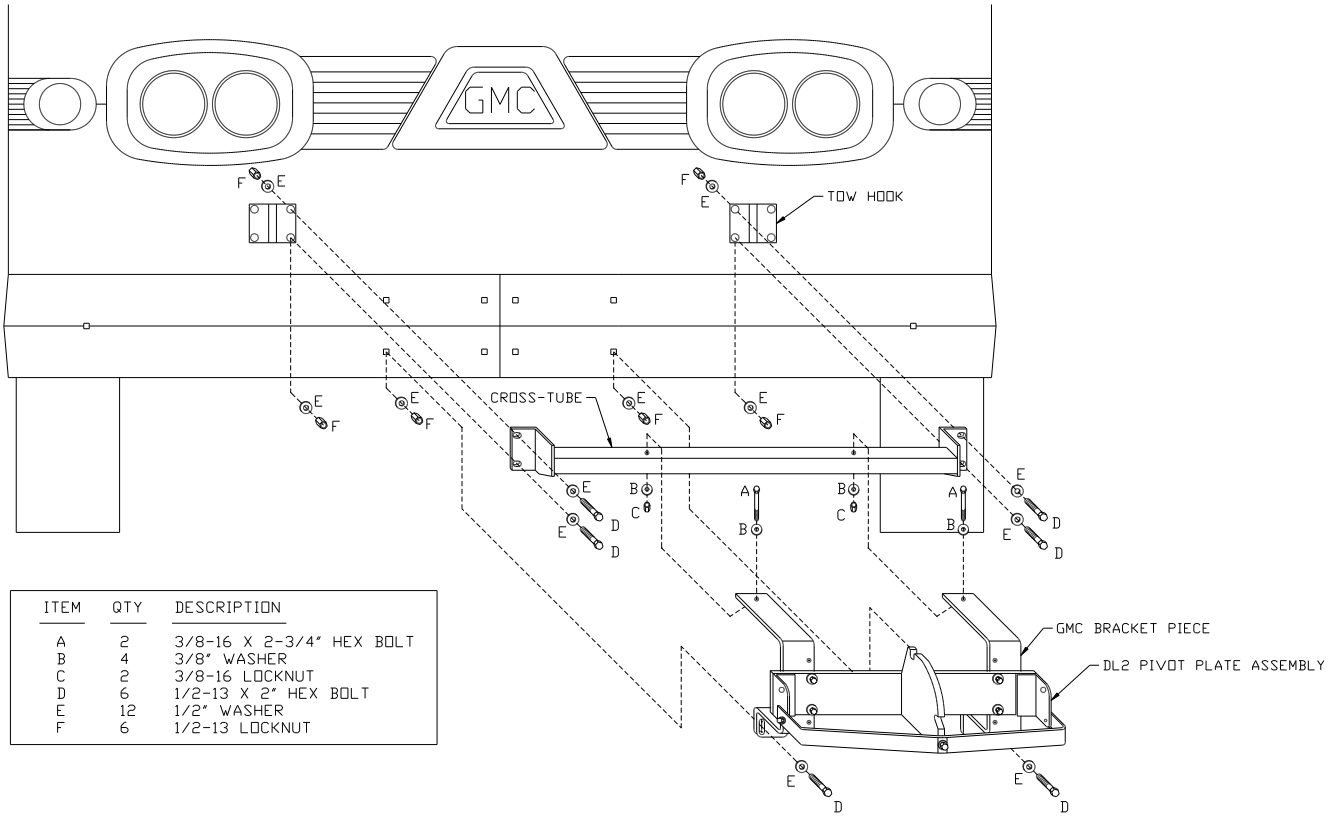
6. Place and firmly hold or tape the GMC Cross-tube Hole Locator Jig on the top surface of the cross-tube and transfer punch two marks onto the cross-tube at the two felt tip marks. The template may be indexed off either edge of the top surface of the cross-tube. See Figure 22.

7. Drill at the two transfer punch marks (made in step 6) from the top surface of the cross-tube directly into the bottom surface using a 13/32” drill.



Installation Fig. 22

8. Assemble the cross-tube to the tow hooks. Assemble the GMC bracket pieces with the attached pivot plate assembly to the coach. See Figure 23. The mounting bracket is now installed.



Installation Fig. 23

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

INSTALLATION KIT
Install to GMC New Look Coach Stock Bumper

1.	1 each	GMC Cross-tube Hole Locator Template
2.	1 each	1/4” transfer punch
3.	1 each	13/32” drill

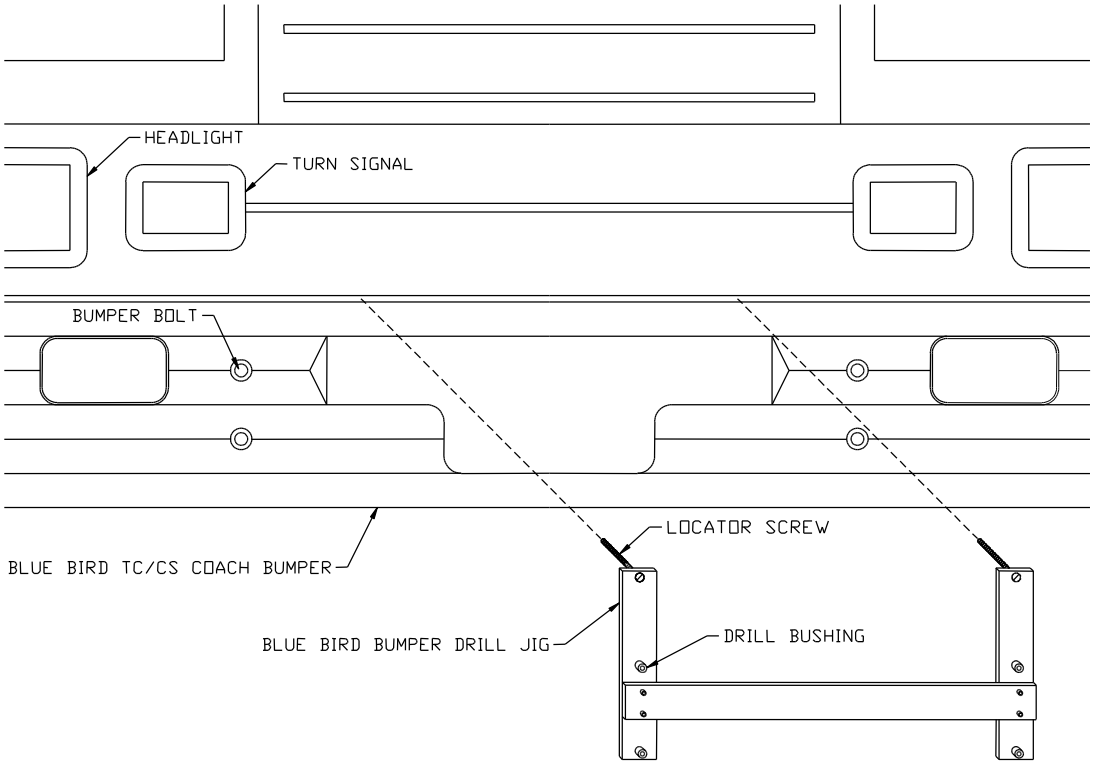
BLUE BIRD TC/CS STOCK BUMPERS

Installing a Sportworks bike rack to a Blue Bird TC/CS coach with stock bumper involves drilling four holes in the front steel bumper.

BIKE RACK INSTALLATION TO BLUE BIRD TC/CS STEEL BUMPER

Follow the installation instructions below to install a Sportworks bike rack and mounting bracket to a Blue Bird TC/CS coach.

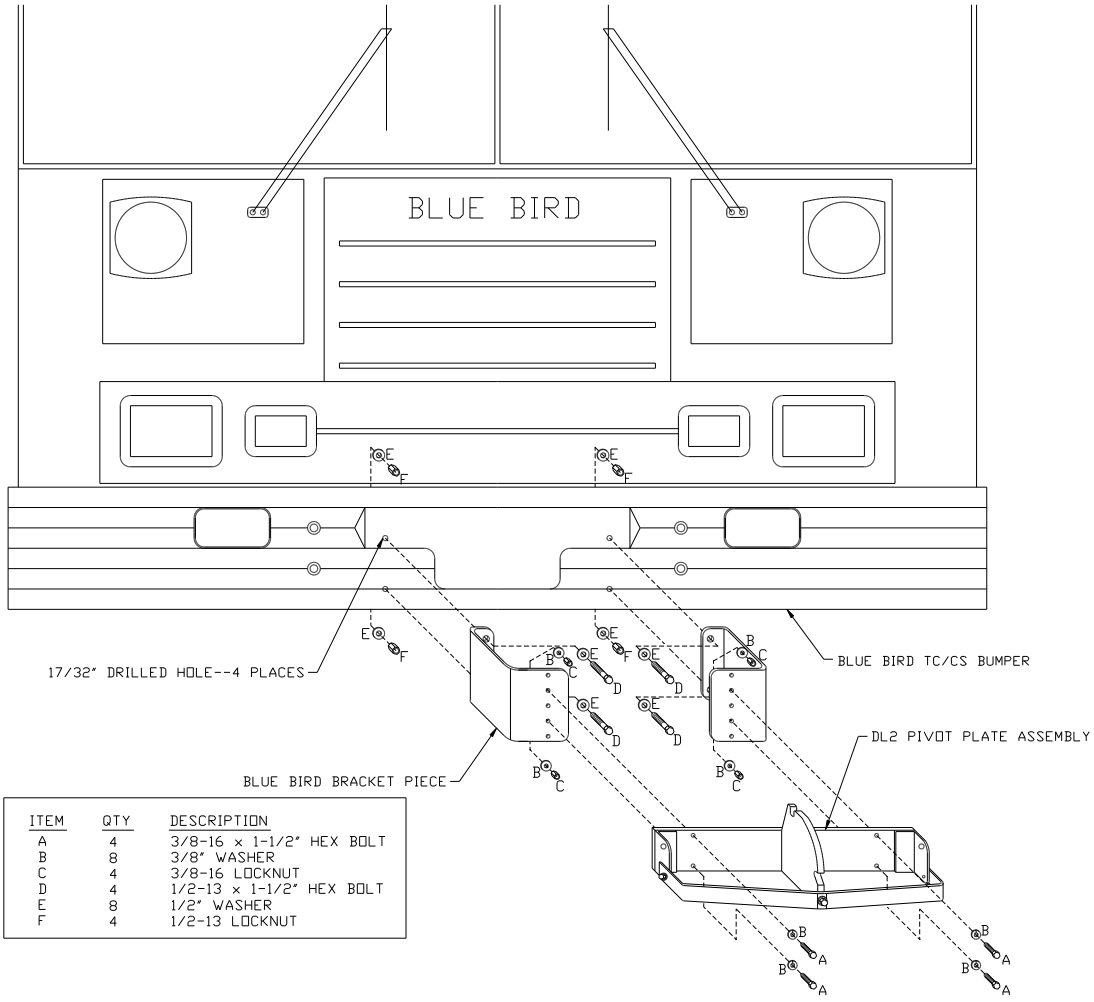
1. Locate the Blue Bird drill jig template on the Blue Bird coach front bumper. Place the locator screws of the jig so that they catch on the top edge of the bumper and allow the template to rest against the bumper surface. Match the center of the template with the center of the bumper. Hold or tape the template firmly in position. See Figure 24.



Installation Fig. 24

2. Transfer punch four deep marks on the front bumper via the drill bushings of the drill jig template. Remove the template from the bumper. Drill a 1/4” pilot hole at each of the transfer punch marks through the front bumper. Maintain a low drill motor RPM and use drill lubricant as required. Next, enlarge the four pilot holes using a 17/32” drill.

3. Loosely assemble each Blue Bird bracket piece to the bumper via the newly drilled holes. Assemble the pivot plate assembly to the Blue Bird bracket pieces. Tighten all bolts once together. This assembly is the mounting bracket. See Figure 25. The mounting bracket is now installed.



Installation Fig. 25

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

INSTALLATION KIT
Install to Blue Bird TC/CS Stock Bumper

1.	1 each	Drill jig template
2.	1 each	1/4" transfer punch
3.	1 each	1/4" pilot drill
4.	1 each	17/32” drill

CLASS III RECEIVER INTERFACE

Install the Sportworks trailer hitch mounting bracket only to a Class III hitch receiver. Verify that the receiver is a Class III hitch receiver before installation. See Figure 26 for the complete bracket assembly.

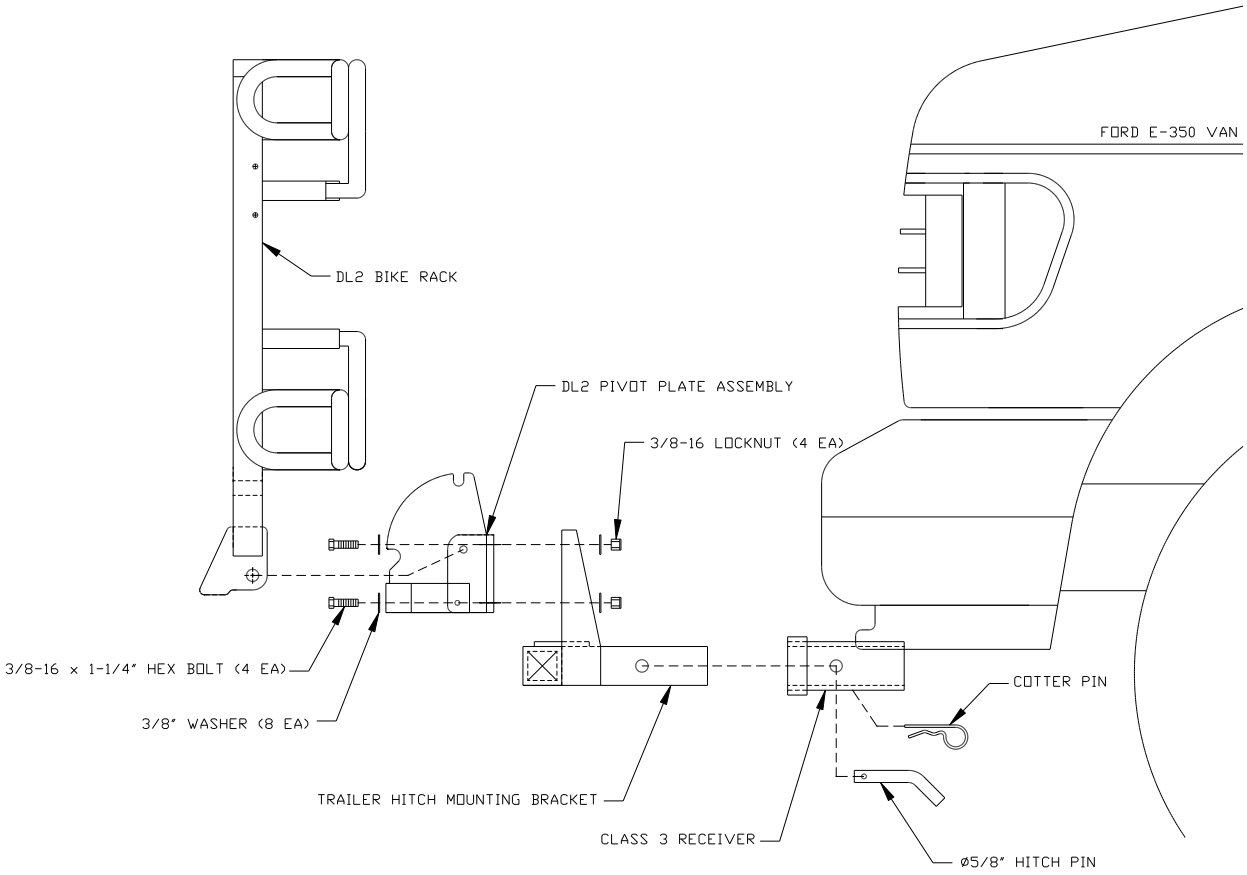
Note:
Obtaining and proper installation of the Class III recieiver hitch is the sole responsibility of the customer. Sportworks Northwest, Inc. does not supply the receiver hitch.

BIKE RACK INSTALLATION TO CLASS III HITCH

1. Insert the Sportworks trailer hitch mounting bracket with the riser tubes “UP” into the Class III hitch receiver and secure it in place with the provided 5/8” diameter hitch pin and cotter pin.

2. Mount the pivot plate assembly to the trailer hitch mounting bracket using the provided 3/8-16 x 1-1/4" hex bolts, washers, and locknuts.

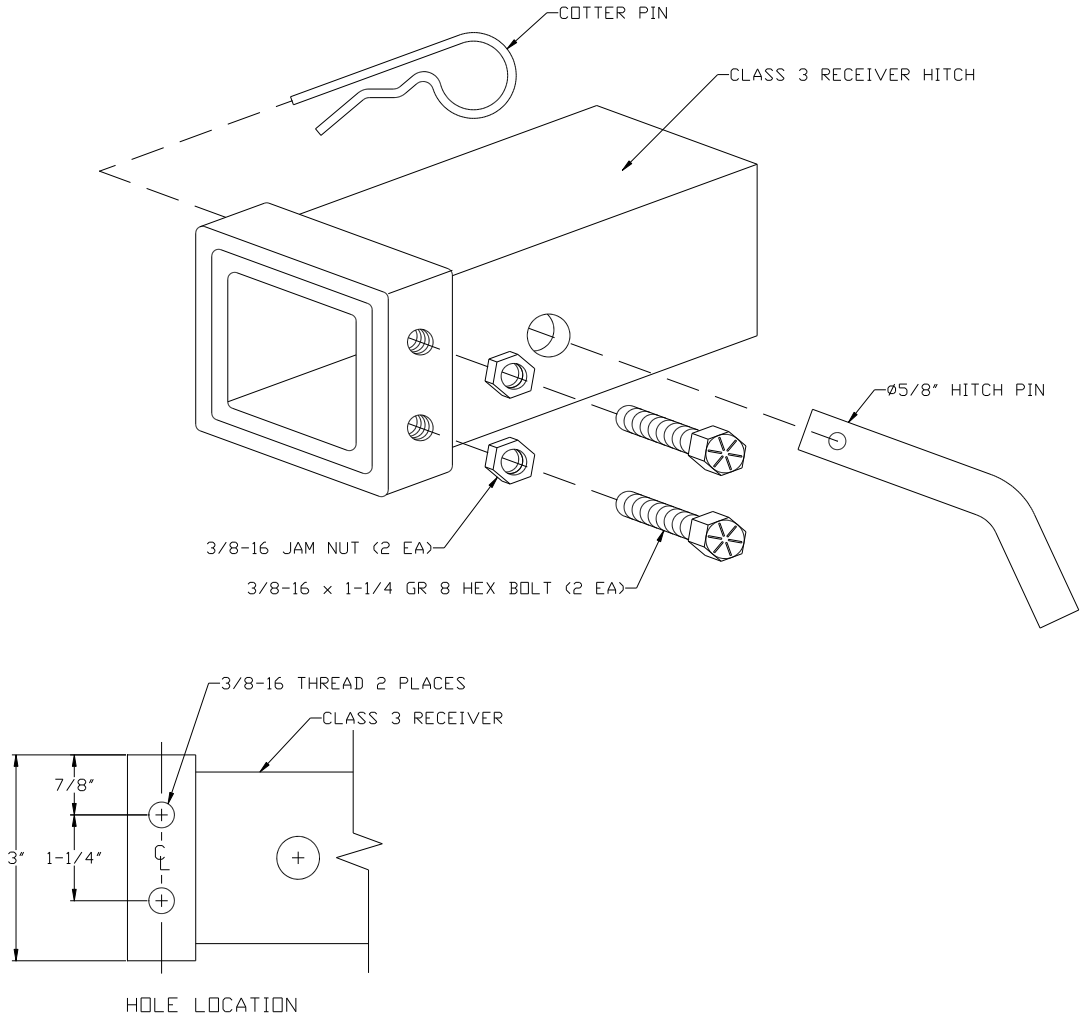
You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.



Installation **Fig. 26**

SPECIAL NOTE:
In some cases the fit between the Sportworks trailer hitch mounting bracket and the Class III receiver hitch is loose enough to cause the bike rack to rest at an angle or rock back and forth during use. This will not impair the use of the rack.

If this movement is unacceptable, we recommend modifying the coach's Class III receiver hitch as illustrated in Figure 27. This modification consists of adding two lock bolts by drilling and tapping two holes on the side of the receiver. With this modification, the trailer hitch mounting bracket and bike rack can be trimmed and locked in place.



Installation Fig. 27

CAUTION: The lock bolts do not replace the 5/8" diameter hitch pin and cotter pin supplied with the mounting bracket. The hitch pin must be used to anchor the mounting bracket and bike rack to the coach.

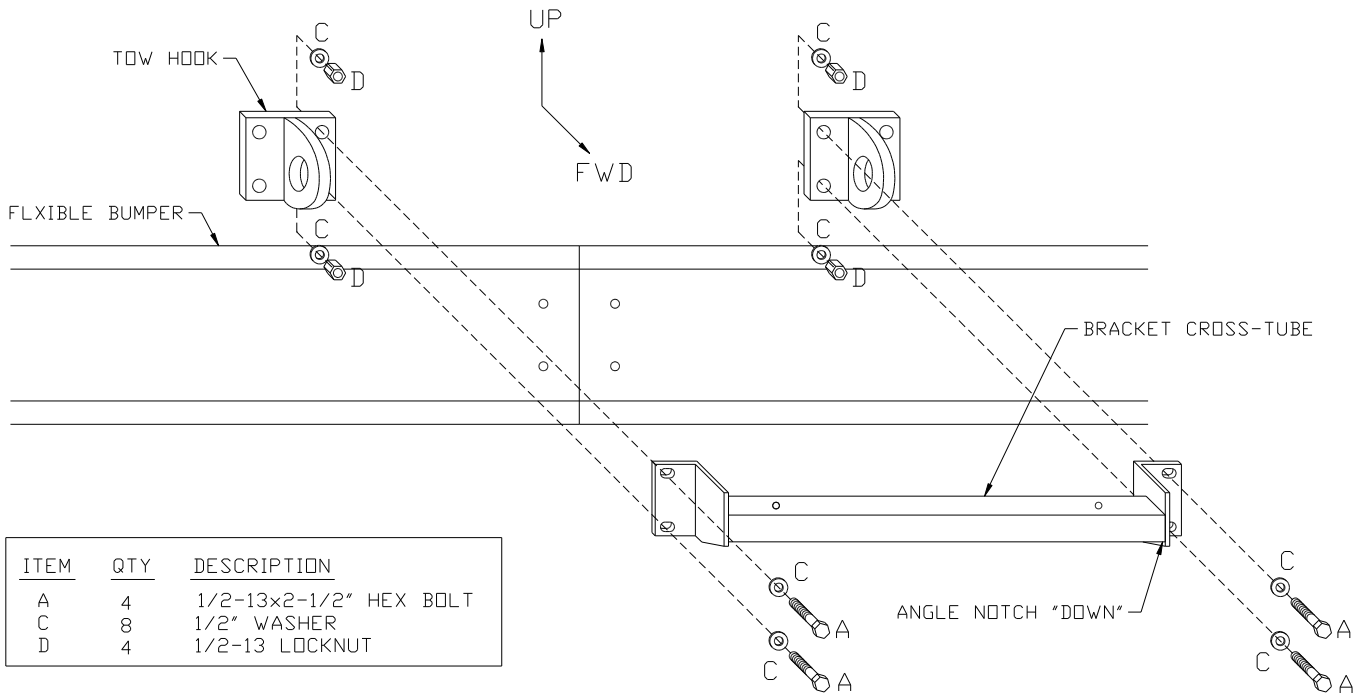
FLXIBLE NEW LOOK BUMPERS

The Sportworks bike rack easily interfaces with the Flxible New Look coach. The mounting bracket consists of two bracket pieces and a support cross-tube that bolt directly to existing tow hook bolt holes and to two drilled holes in the Flxible coach front bumper. The bike rack is then fastened to the mounting bracket.

BIKE RACK INSTALLATION TO FLXIBLE NEW LOOK BUMPER

Follow the installation instructions below to install a Sportworks bike rack to a Flxible New Look coach with stock metal bumper.

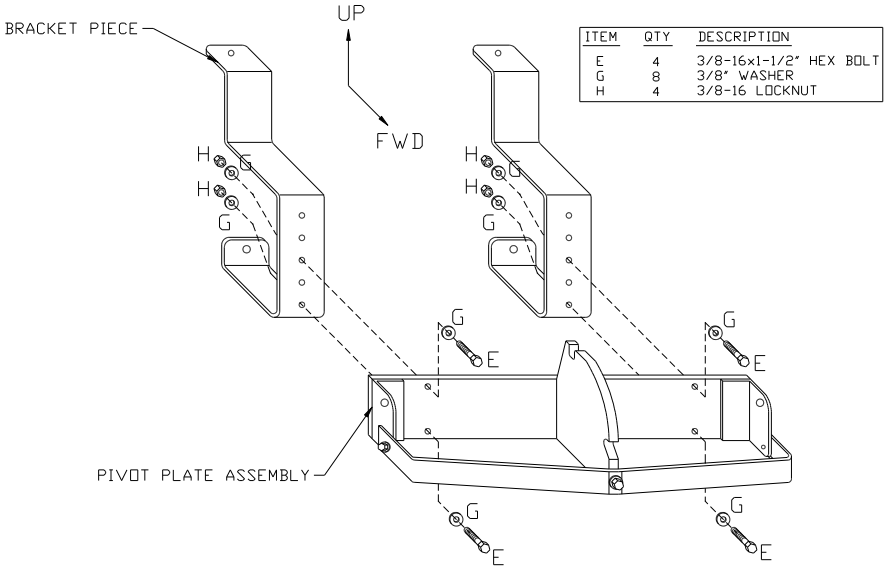
1. Examine both tow hooks on the front face of the Flxible New Look coach. Each tow hook is anchored to the coach face via four bolts. Remove the two bolts from each tow hook that are oriented “INBOARD” towards the bumper centerline.



ITEM	QTY	DESCRIPTION
A	4	1/2-13x2-1/2" HEX BOLT
C	8	1/2" WASHER
D	4	1/2-13 LOCKNUT

Installation Fig. 28

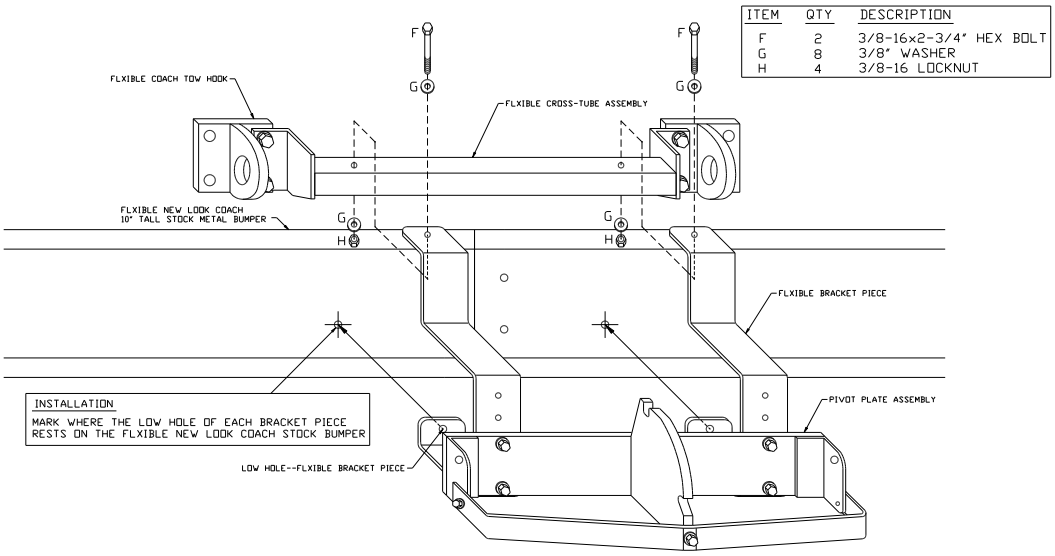
2. Place the mounting bracket cross-tube piece so that it spans between the two tow hooks. Orient the notches of the cross-tube angle pieces “DOWN”. Assemble the cross-tube to the coach using the 1/2-13 x 2-1/2” hex bolts, washers, and locknuts. See Figure 28.



Installation Fig. 29

3. Fasten the pivot plate assembly to each Flxible bracket piece at the desired height location using the 3/8-16x1-1/2” hex bolts, washers, and locknuts provided. See Figure 29.

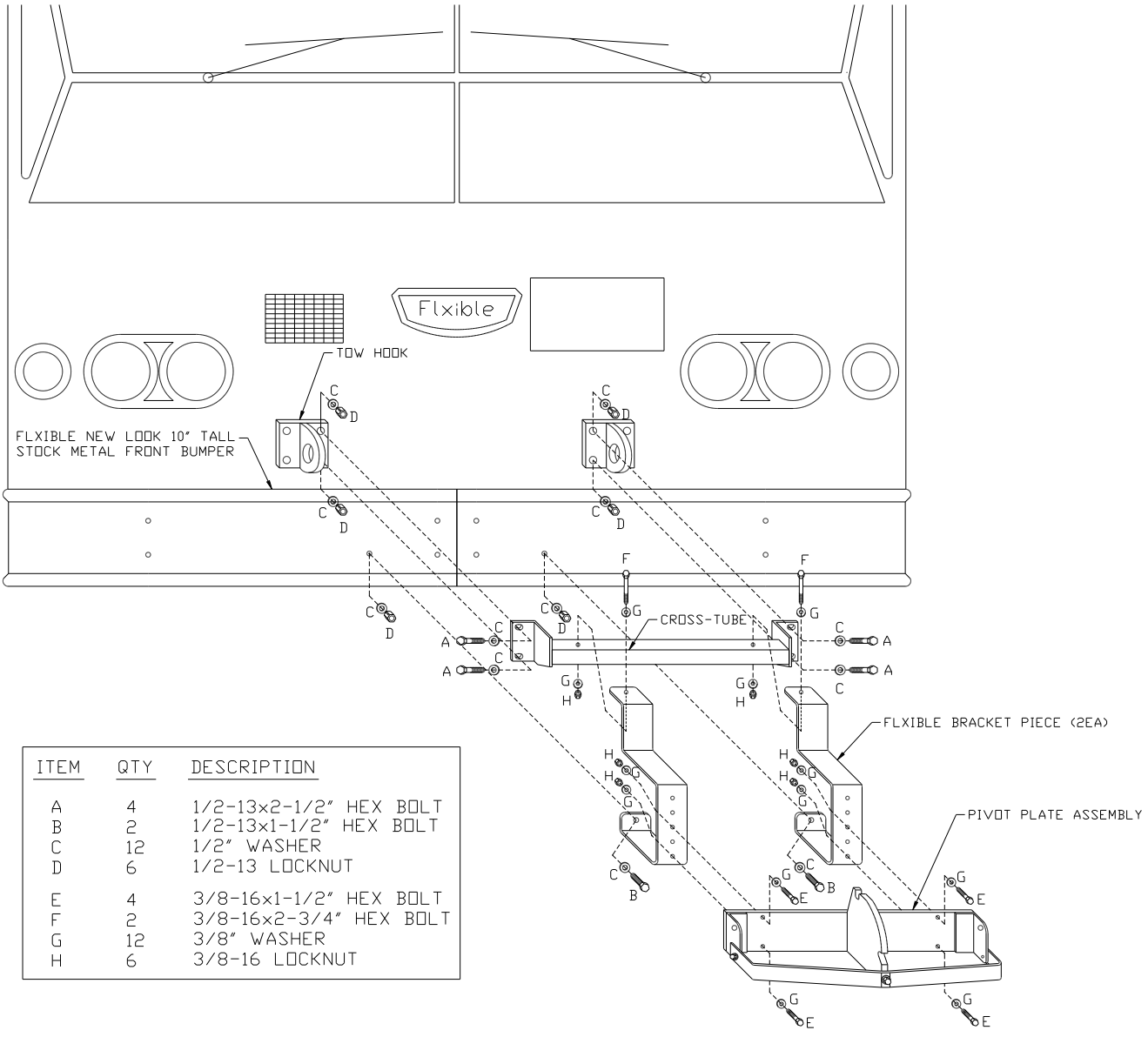
4. Mount the Flxible bracket pieces with the attached pivot plate assembly to the cross-tube using the provided 3/8-16 x 2-3/4” hex bolts. Use a felt tip marker to mark where the lower hole of each bracket piece contacts the front bumper. This mark will indicate the drill hole location (2 ea.) on the front bumper to anchor each bracket piece. See Figure 30.



Installation Fig. 30

5. Center punch the two marks made in step 4 and drill through the front bumper using a 1/4” pilot drill, then enlarge the holes using a 17/32” drill.

6. Remount the bracket pieces with the attached pivot plate assembly to the cross-tube. Fasten the lower portion of the bracket pieces to the bumper via the newly drilled holes of step 5 using the provided 1/2-13 x 1-1/2” hex bolts, washers, and locknuts. The Flxible New Look mounting bracket is now installed. See Figure 31.



ITEM	QTY	DESCRIPTION
A	4	1/2-13x2-1/2" HEX BOLT
B	2	1/2-13x1-1/2" HEX BOLT
C	12	1/2" WASHER
D	6	1/2-13 LOCKNUT
E	4	3/8-16x1-1/2" HEX BOLT
F	2	3/8-16x2-3/4" HEX BOLT
G	12	3/8" WASHER
H	6	3/8-16 LOCKNUT

Installation Fig. 31

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

FORD OEM STEEL BUMPERS (VENTED OPENING)

BIKE-RACK INSTALLATION TO FORD E-350/E-450 BUMPER

The custom mounting bracket for the Ford Cutaway Van (E-350, E-450) consists of a formed steel backing plate, four 1 1/2” diameter stand-offs, a mounting plate, and a pair of stabilizer struts. The backing plate is bolted to the vehicle frame ends; sandwiched between the bumper and frame. Four standoffs pass through holes in the bumper face, and the mounting plate is attached to the backing plate with bolts passing through the stand-offs. Two stabilizer struts connect from the lower corners of the mounting plate to the frame of the vehicle.

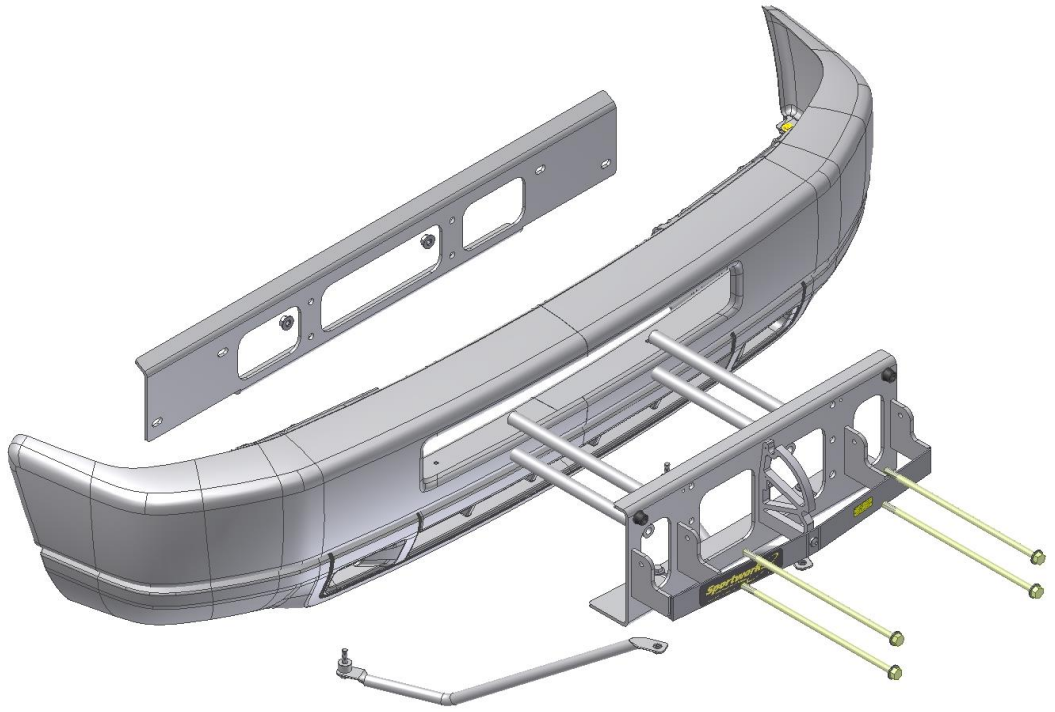


FIGURE 1: Exploded View of Ford with OEM Bumper

Installing the Bike-Rack-for-Buses mounting bracket to the Ford chassis involves removing the bumper and sawing four holes through the steel bumper:

1. Remove the bumper from the vehicle. Lay the bumper face down and support it with blocks as necessary to keep the bumper level and stable. Lay the backing plate inside the bumper over the captured studs. The bent edges of the backing plate should face up with the shorter bent edge toward the bottom edge of the bumper. The backing plate should rest level and straight within the bumper. The two parts can be bolted together temporarily to ensure positioning.

FORD OEM STEEL BUMPERS (VENTED OPENING)

BIKE-RACK INSTALLATION TO FORD E-350/E-450 BUMPER

2. Using the backing plate as a template to locate, mark the positions of the two holes to be sawn though the bumper.

3. Drill two ¼" pilot holes at the marked locations from the back of the bumper through the front. These holes will allow the stand-offs to pass through the bumper to the backing plate. The one pair of stand-offs will pass through the vent opening in the bumper.

4. Using a 1–5/8" to 1-7/8" diameter hole saw with a ¼" pilot, saw two holes through the metal bumper and the plastic facing. De-burr the edges of the holes.

5. Reinstall the bumper to the vehicle with the backing plate sandwiched between the bumper and the frame ends. The bent edges of the backing plate face rearward, with the shorter bent edge at the bottom. To allow alignment, leave the bumper bolts loose enough to allow shifting of the backing plate while attaching the standoffs and the mounting plate.

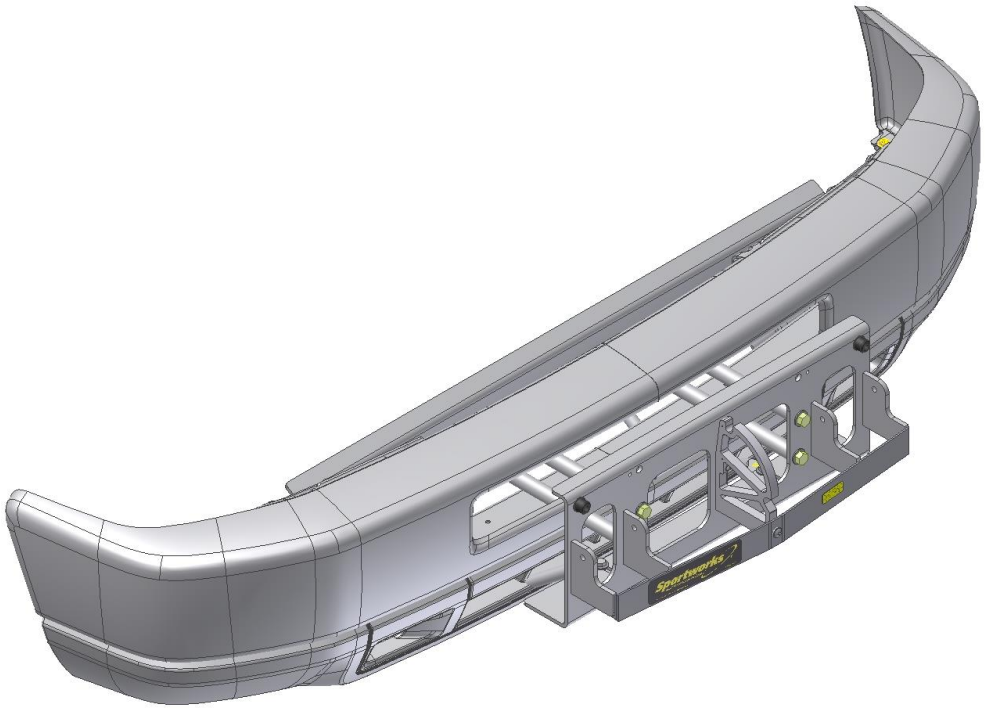


FIGURE 2: Ford with OEM Bumper

BIKE-RACK INSTALLATION TO FORD E-350/E-450 BUMPER
(Late Model Bumper With Vent Openings)

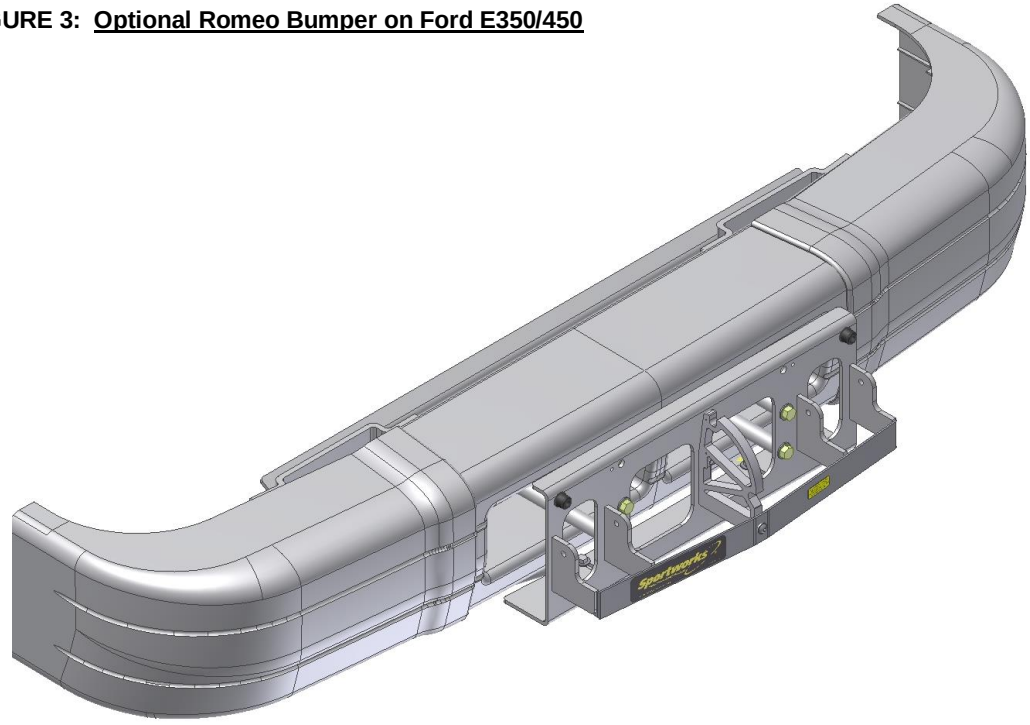
6. Place the four 1 1/2” diameter standoffs through the sawn holes and vent opening until they contact the backing plate. Use the four 3/8-16 x 6-1/2 bolts to assemble the standoffs and mounting plate to the backing plate as shown.

7. You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

NOTE:

The mounting method for non-vented bumpers is similar, except that two additional holes must be made to facilitate the two lower stand-offs. See steps 2 and 3 above.

FIGURE 3: Optional Romeo Bumper on Ford E350/450



FORD E450 WITH DUAL RECEIVERS

BIKE-RACK INSTALLATION TO FORD E450 BUMPER

The custom mounting bracket for the Ford E450 consists of a dual port receiver mount and right and left removable brackets. The receiver mount is bolted to the vehicle frame ends; sandwiched between the bumper and frame. Two mounts pass through holes in the bumper face, and the brackets slide into receiver mounts with pins passing through mounts and brackets.

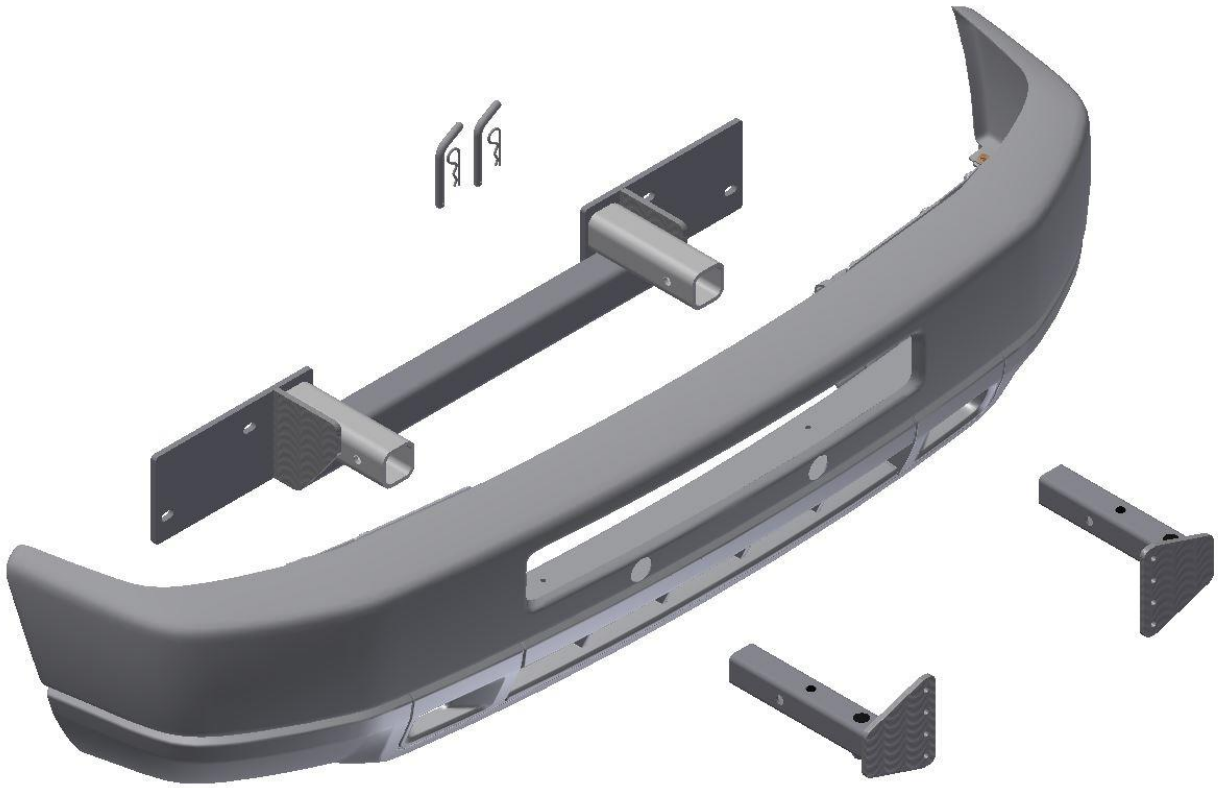


FIGURE 1: Exploded View of Ford with OEM Bumper

Installing the Bike-Rack-for-Buses mounting bracket to the Ford chassis involves removing the bumper and sawing four holes through the steel bumper:

1. Remove the bumper from the vehicle. Lay the bumper face down and support it with blocks as necessary to keep the bumper level and stable. Lay the backing plate inside the bumper over the captured studs. The backing plate should rest level and straight within the bumper. The two parts can be bolted together temporarily to ensure positioning.

FORD E450 WITH DUAL RECEIVERS

BIKE-RACK INSTALLATION TO FORD E450 BUMPER

2. Using the backing plate as a template to locate, mark the positions of the two holes to be sawn though the bumper.

3. Reinstall the bumper to the vehicle with the backing plate sandwiched between the bumper and the frame ends. To allow alignment, leave the bumper bolts loose enough to allow shifting of the backing plate while attaching the standoffs and the mounting plate.

FIGURE 2: Ford with OEM Bumper

BIKE-RACK INSTALLATION TO FORD E-350/E-450 BUMPER (Late Model Bumper With Vent Openings)

4. Place the four 1 1/2” diameter standoffs through the sawn holes and vent opening until they contact the backing plate. Use the four 3/8-16 x 6-1/2 bolts to assemble the standoffs and mounting plate to the backing plate as shown.

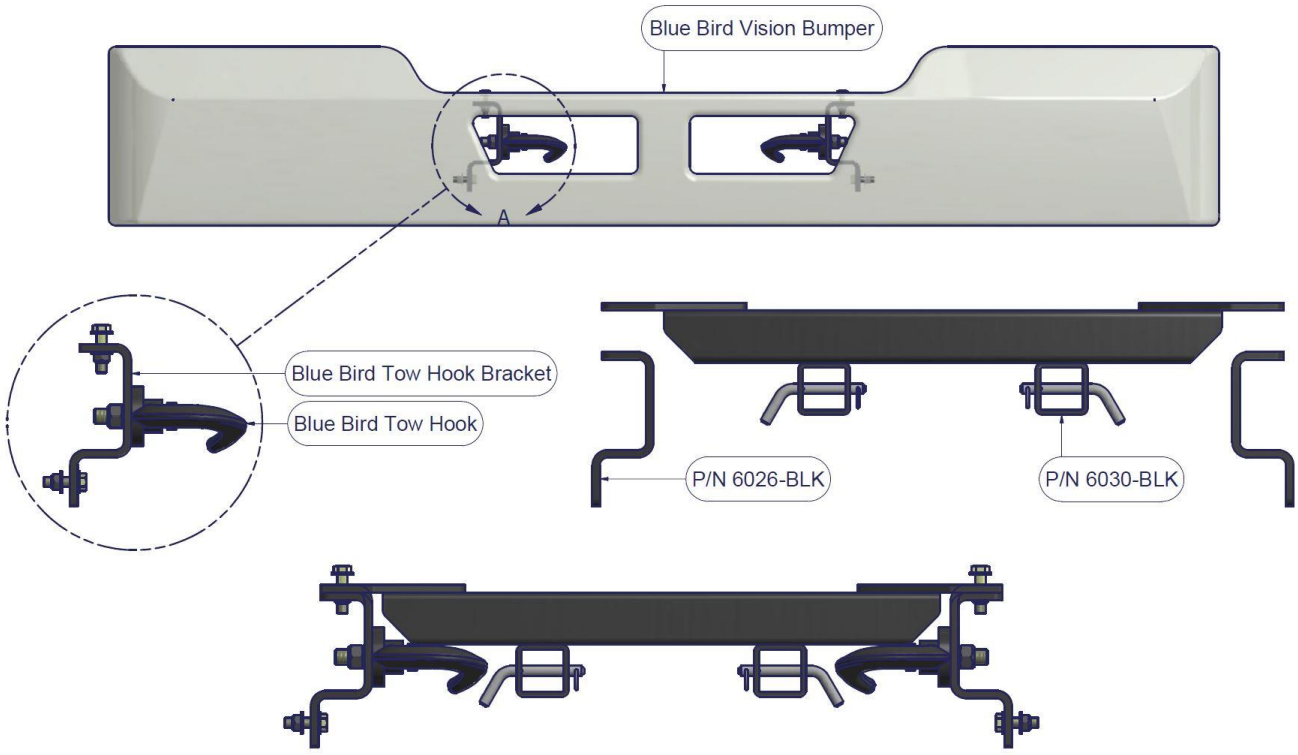
5. You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

BLUE BIRD VISION DUAL RECEIVER BRACKET

BIKE-RACK INSTALLATION TO BLUE BIRD VISION BUMPER

Note: Existing Blue Bird fasteners will be resused and should be torqued as follows. Torque 3/4-10 fasteners to 325 ft-lbs, 5/8-11 fasteners to 180 ft-lbs, & 1/2-13 fasteners to 90 ft-lbs.

1. Remove both Blue Bird Tow Hook & Bracket assemblies from the bus.
2. Seperate both Tow Hooks from their respective brackets.
3. Assemble the Tow Hooks to the Sportworks Tow Hook Brackets, P/N 6026-BLK, with both Tow Hooks curving downward as shown.
4. Install the two assemblies from the previous step with P/N 6030-BLK as shown in the bottom view.



GOSHEN SENTRY COACH OEM STEEL BUMPER

BIKE RACK INSTALLATION TO GOSHEN SENTRY STEEL OEM BUMPER VIA A CLASS III RECEIVER HITCH

The recommended method for mounting the Sportworks bike rack to the Goshen Sentry Coach is to use a Class 3 receiver hitch bracket (Fig. 1). This method requires the installation of a 2" square class 3 receiver hitch directly to the frame of the vehicle. This receiver hitch can be custom fabricated and installed by a qualified trailer hitch shop.

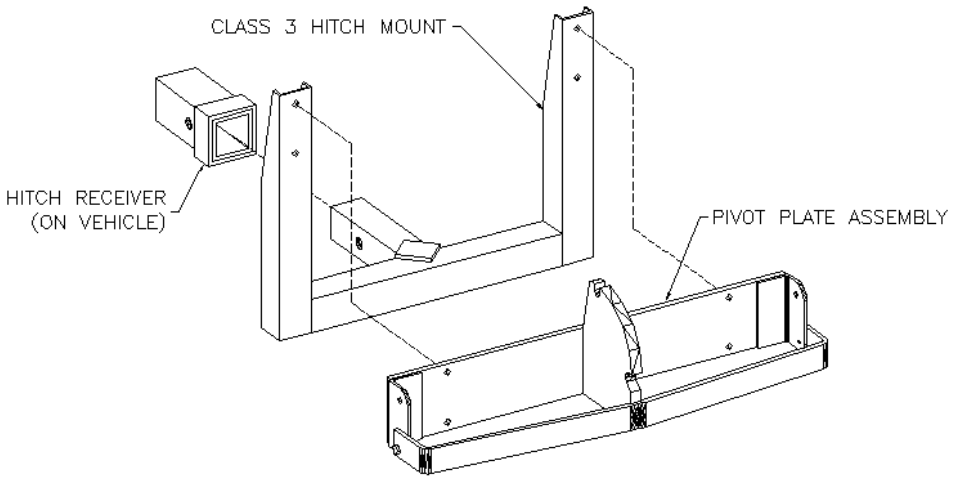
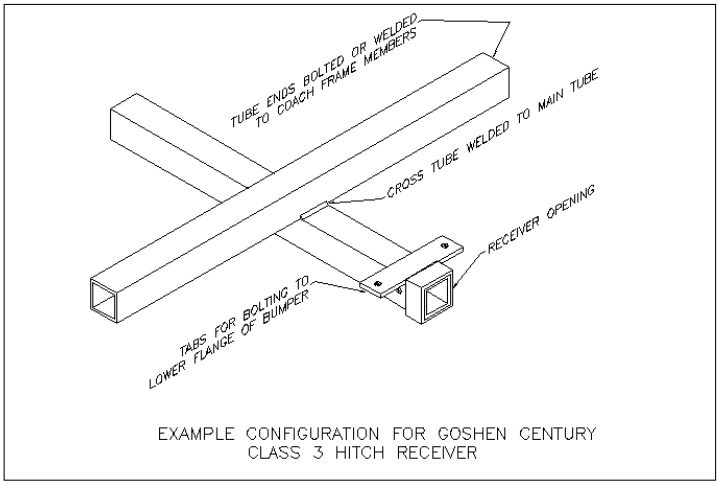


FIGURE 1

The edge of the 2" square hitch receiver should be mounted flush with the front of the bumper and not more than ½" below the bumper (Fig. 3). It is recommended that tabs be welded onto the receiver to allow it to be bolted to the bottom flange of the bumper for stability (Fig. 2).

An example hitch configuration is shown for reference:

FIGURE 2



With the hitch receiver installed, the Sportworks hitch bracket is inserted into the receiver and pinned in place. The pivot plate assembly is bolted to the two uprights using the supplied hardware (Fig. 3). With the pivot plate assembly securely in place, the rack can be mounted as shown in Section 3 of the owners' manual.

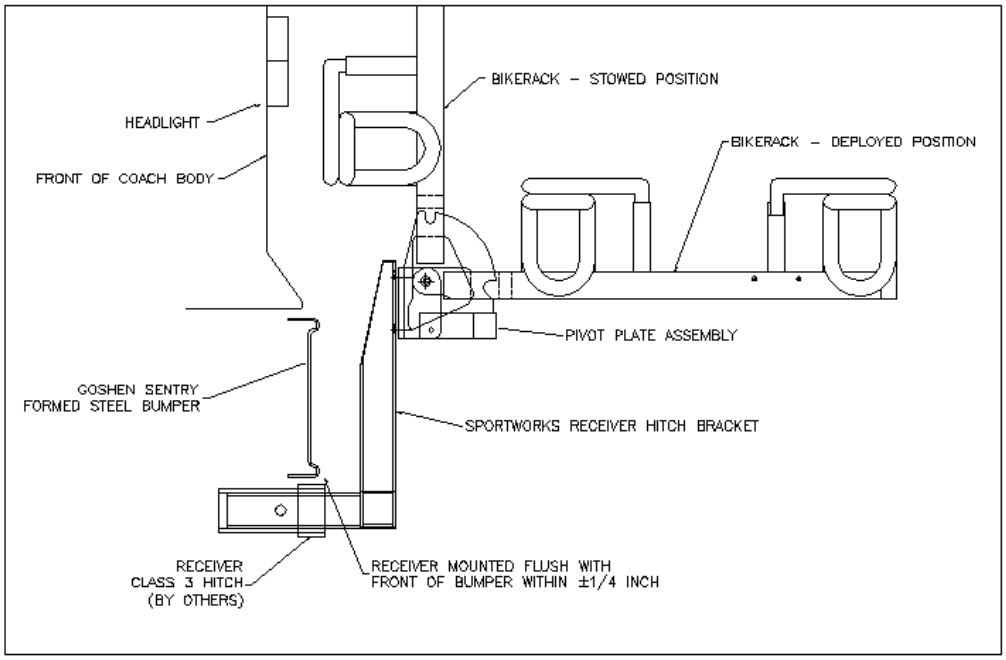


FIGURE 3

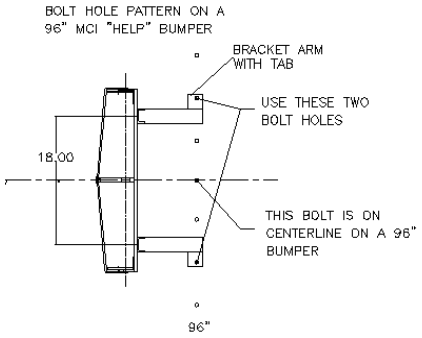
MCI FLIP-DOWN ENERGY ABSORBING BUMPERS

BIKE RACK INSTALLATION TO MCI FLIP-DOWN BUMPER

This bracket attaches to the bumper using four of the existing threaded holes in the bumper steel backing beam. Access slots are cut through the plastic bumper face at the locations of the bracket arms. The existing bolts (two top and two bottom) at the bracket arm locations are removed. Spacers are placed between the bracket and the backing beam, and the arms are attached using the supplied longer bolts.

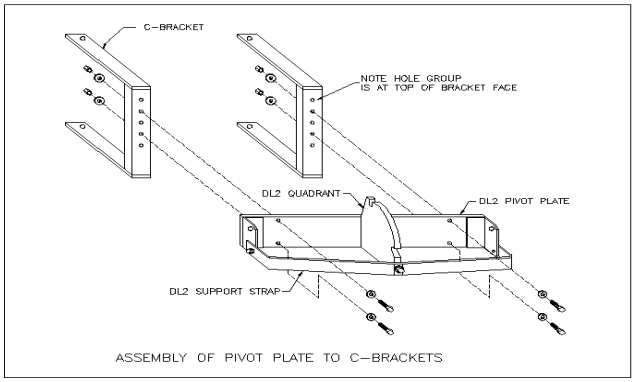
Figure 1 shows the most common bumper bolt spacing and the bracket type used. f Double check that the brackets to be mounted are correct for the bumper style.

FIGURE 1



1) Assemble the C-brackets to the pivot plate and use this assembly to locate the slot positions (Fig. 2). Cut four 2-1/8” x 1/2” access slots with centers located 9” each side of the bumper centerline. The slots should be flush with the top and bottom edges of the steel backing beam. Use a keyhole saw, spiral cut saw, or jigsaw to cut the slots.

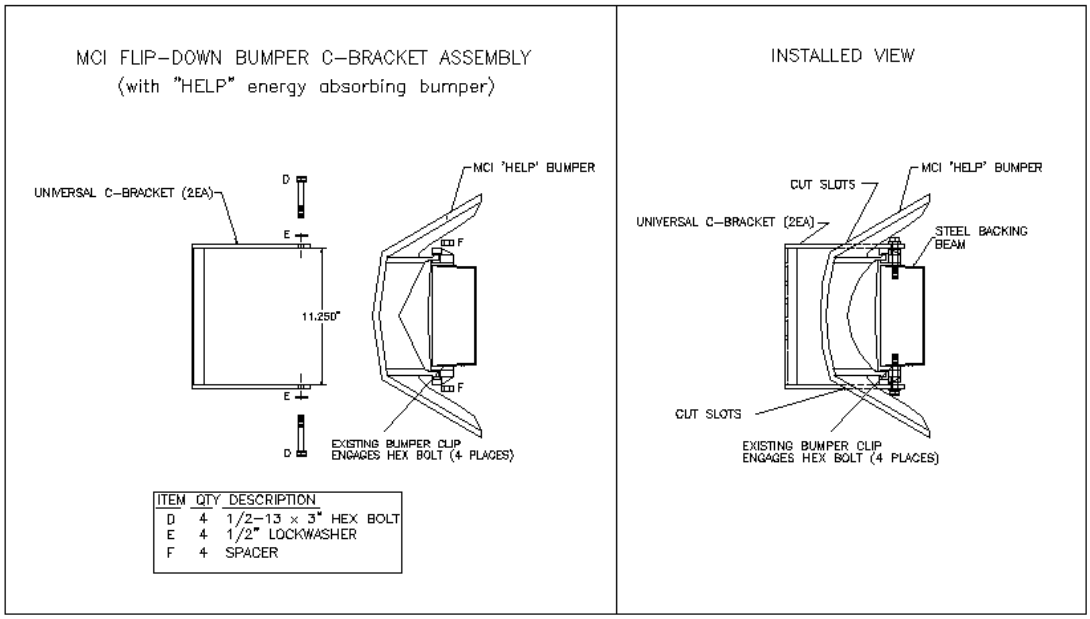
FIGURE 2



MCI FLIP-DOWN ENERGY ABSORBING BUMPERS

BIKE RACK INSTALLATION TO MCI FLIP-DOWN BUMPER

2) Remove the existing bolts in the top and bottom of the backing beam and slip the C-Bracket arms through the slots. Line up the mounting holes. Slip the supplied spacers between the C-bracket arms and the beam and attach using ½-13 x 3" long mounting



bolts (Fig. 3).

FIGURE 3

3) Sportworks NW recommends mounting a safety chain between the bumper and frame (Fig. 4). This will prevent the bumper from opening far enough to allow the deployed bike rack to contact the road surface in the event that the bumper latch fails, or is released accidentally.

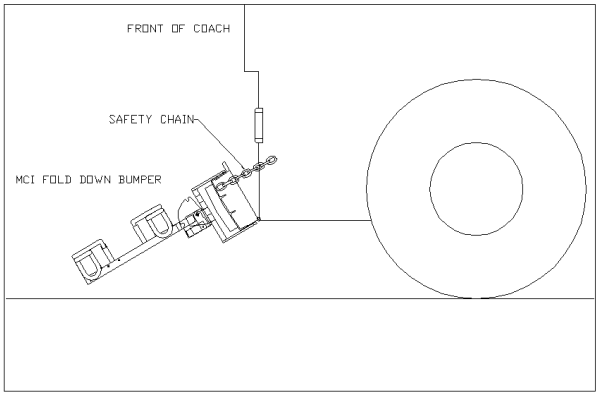


FIGURE 4

4) Tighten all bolts securely. You are now ready to install the bike rack. Refer to **MOUNTING THE BIKE RACK** at the end of this section.

NOVA LOW-FLOOR COACHES

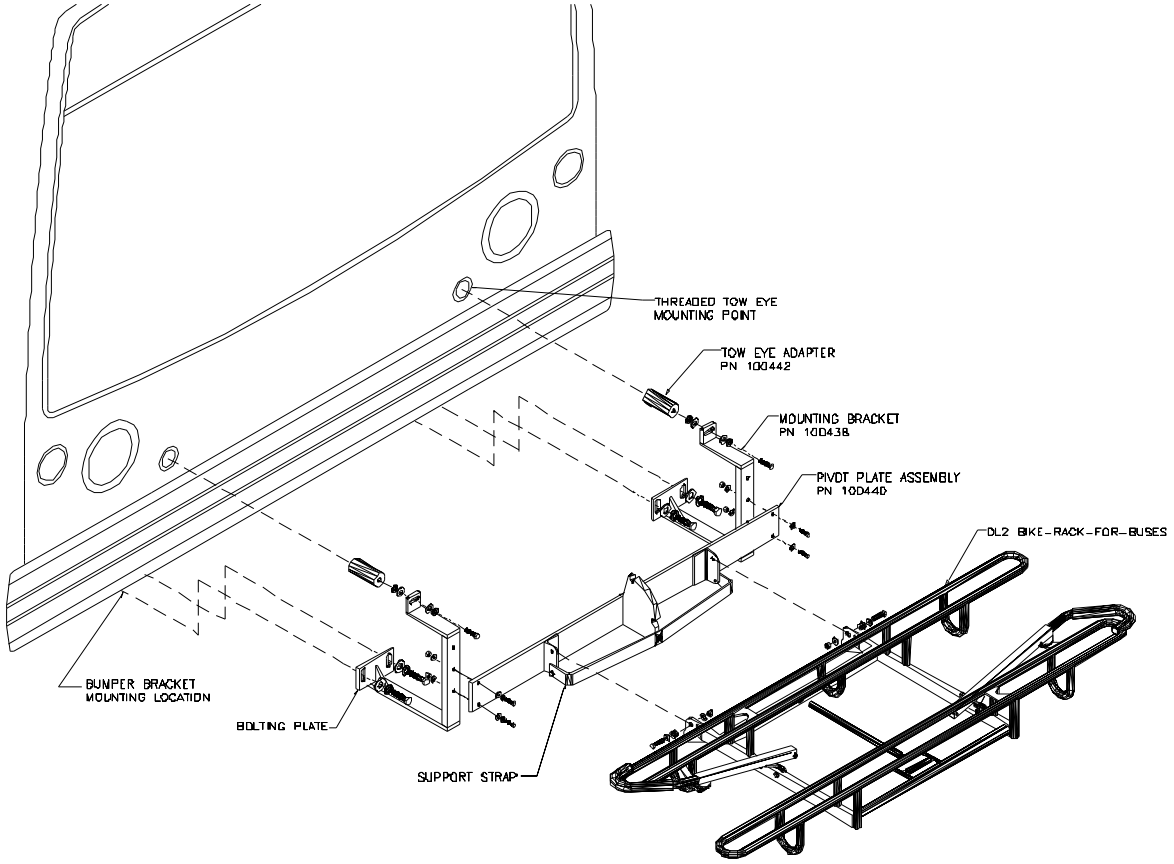
These instructions apply to the Nova Low-Floor Coach fitted with the 102 inch TRANSPEC Energy Absorbing Bumper. The bike rack attaches to a pivot plate spanning two C-brackets which are bolted to the coach body. The complete bracket assembly includes two C-brackets, one extra long pivot plate assembly, two threaded tow-eye adapters, and the associated bolt kits. (See Fig. 1)

BIKE RACK INSTALLATION TO NOVA LOW-FLOOR BUMPERS

1) Remove the tow-eyes or hooks from the screw-in mounting points on the front of the coach.

2) Insert the threaded tow-eye adapters into the tow-eye mounting points. A ¼ inch hole near the outer end of the adapters allows insertion of a rod to turn the adapters. The ½-13 threaded hole in one end of the adapters should face forward. Screw both adapters in so that they protrude about one inch from the face of the bus. They can be adjusted later to set the angle of the C-bracket

NOVA LOW-FLOOR FIG. 1



NOVA LOW-FLOOR COACHES (continued)

3) Remove the two lower bolts at each bumper mounting bracket, located behind the bumper and about 22 inches each side of center.

4) Bolt the C-Brackets loosely into the tow-eye adapters, with the lower bolting plate tucked behind the bumper over the existing bumper bolt holes. Adjust the tow-eye adapters so that the bolting plate contacts the bumper bracket face and the front of the C-bracket is vertical and plumb.

5) Replace the lower bumper mounting bolts, loosely bolting the bottom of the C-brackets into place.

6) Bolt the pivot plate assembly to the C-brackets. Two vertical positions are possible. Generally the lower position is used unless there is a clearance problem.

7) Adjust the bolted assembly so that it is level, centered and plumb. Tighten all bolts.

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE RACK** at the end of this section.

INTERNATIONAL-NAVISTAR OEM STEEL BUMPER (VENTED OPENING)

BIKE-RACK INSTALLATION TO INTERNATIONAL NAVISTAR OEM STEEL BUMPER

The custom mounting bracket for the International 3200-3400 consists of both top and bottom custom laser cut bracket plates, four 1” diameter by 7/8” long aluminum spacers, and four 60mm M12 bolts with washers. Both the top and bottom mounting brackets are affixed using both the 60mm bolts supplied and existing bolt holes in the bumper. The 60mm bolts replace the stock bolts as the stock bolts are not long enough to accommodate the added thickness of the brackets and spacers.

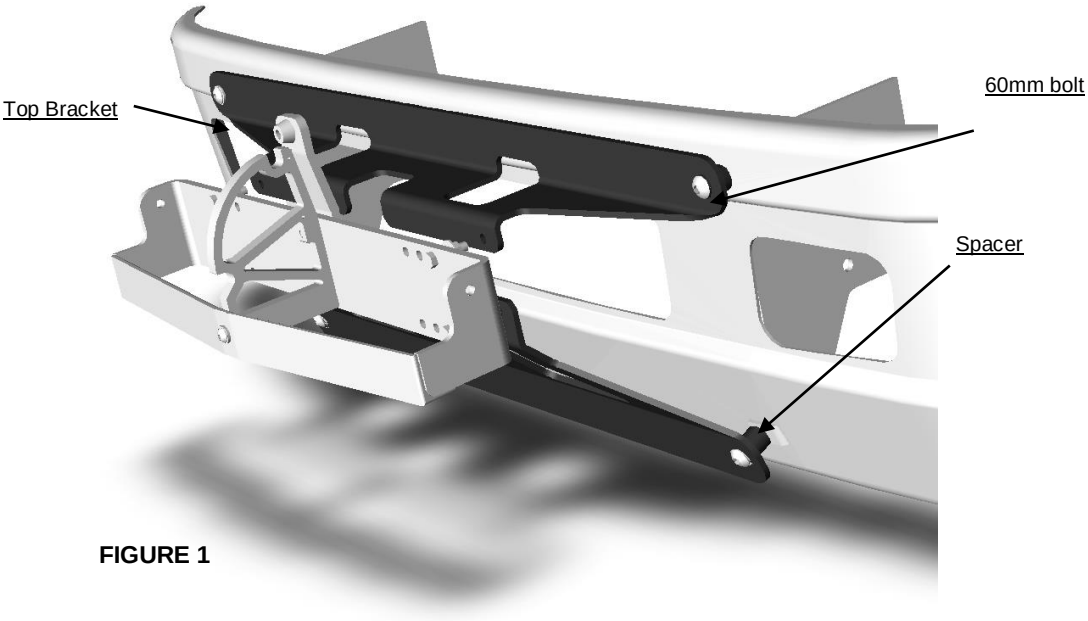


FIGURE 1

Installing the Bike-Rack-for-Buses mounting bracket to the International chassis does not involve completely removing the bumper.

1. Remove both of the existing upper bumper attachment bolts.

2. Install the top bracket using the 60 mm bolts and washers provided being sure to insert a spacer between the face of the bumper and the back of the bracket (see figure 1). Use of thread locking compound is recommended.

3. Leave bracket snug but not completely tight until installation of both the bottom bracket and Pivot Plate Assembly have been completed.

INTERNATIONAL-NAVISTAR OEM STEEL BUMPER

BIKE-RACK INSTALLATION TO INTERNATIONAL NAVISTAR OEM STEEL BUMPER (continued)

4. Remove both of the existing lower bumper attachment bolts.

5. Install the bottom bracket in the same manner as the top; using the 60 mm bolts and washers provided (see step 2 and figure 1). Use of thread locking compound is recommended.

6. Install Pivot Plate Assembly to upper and lower brackets, moving brackets as required to achieve proper bolt hole alignment.

7. Torque Pivot Plate Assembly attachment bolts to 50-60 Ft-Lb (65-80 Nm)

8. Torque bumper/bracket attachment bolts to 65-80 Ft-Lb (90-110 Nm)

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE RACK** at the end of this section.

Chevy/GMC 4500-5500 OEM STEEL BUMPER

BIKE-RACK INSTALLATION TO Chevy/GMC OEM STEEL BUMPER

The custom mounting bracket for the Chevy/ GMC consists of both Left and Right custom laser cut formed bracket plates, and four 40mm Hex Head Cap Screws with washers. Both the left and right mounting brackets are affixed using both the 40mm Cap Screws supplied and existing bolt holes in the bumper. The 40mm bolts replace the stock bolts as the stock bolts are not long enough to accommodate the added thickness of the brackets and spacers.

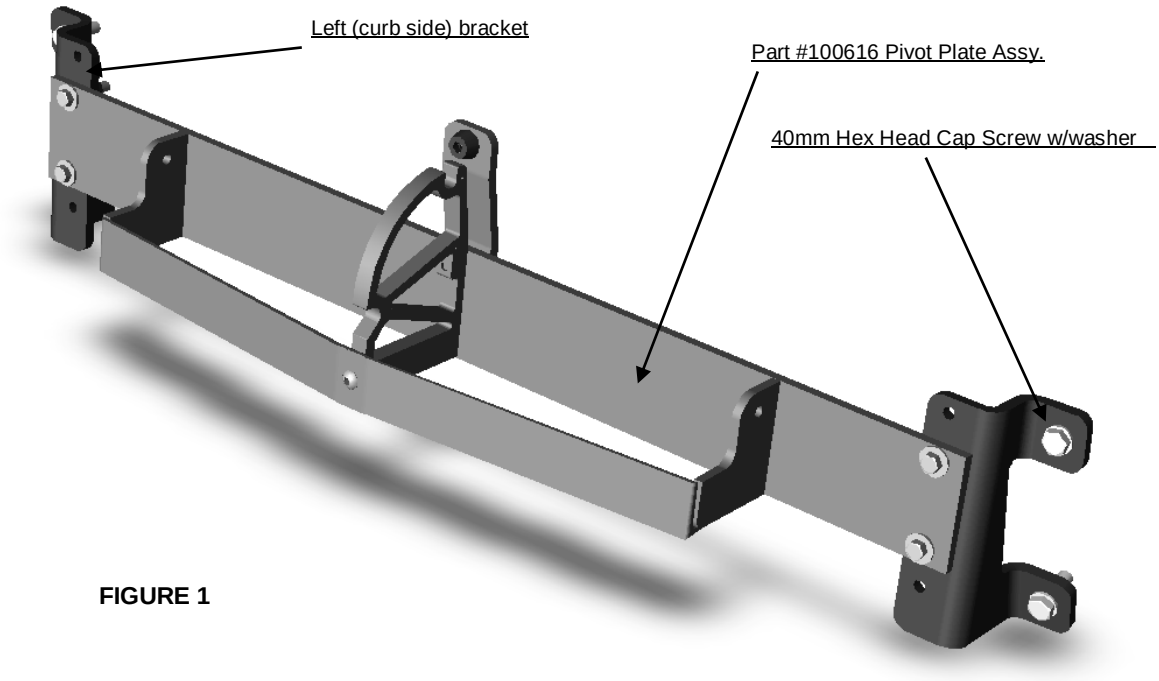


FIGURE 1

Installing the Bike-Rack-for-Buses mounting bracket to the Chevy/GMC chassis does not involve completely removing the bumper.

1) Remove both of the existing CURB SIDE bumper attachment bolts.

2) Install the CURB SIDE bracket using the 40 mm bolts and washers provided (see figure 1). Use of thread locking compound is recommended.

3) Leave bracket snug but not completely tight until installation of both the street side bracket and Pivot Plate Assembly have been completed.

Chevy/GMC 4500-5500 OEM STEEL BUMPER

BIKE-RACK INSTALLATION TO Chevy/GMC OEM STEEL BUMPER (continued)

4) Remove both of the existing STREET SIDE bumper attachment bolts.

5) Install the STREET SIDE bracket in the same manner as the curb side; using the 40 mm bolts and washers provided (see step 2 and figure 1). Use of thread locking compound is recommended.

6) Install Pivot Plate Assembly (part #100616) to left and right brackets, moving brackets as required to achieve proper bolt hole alignment.

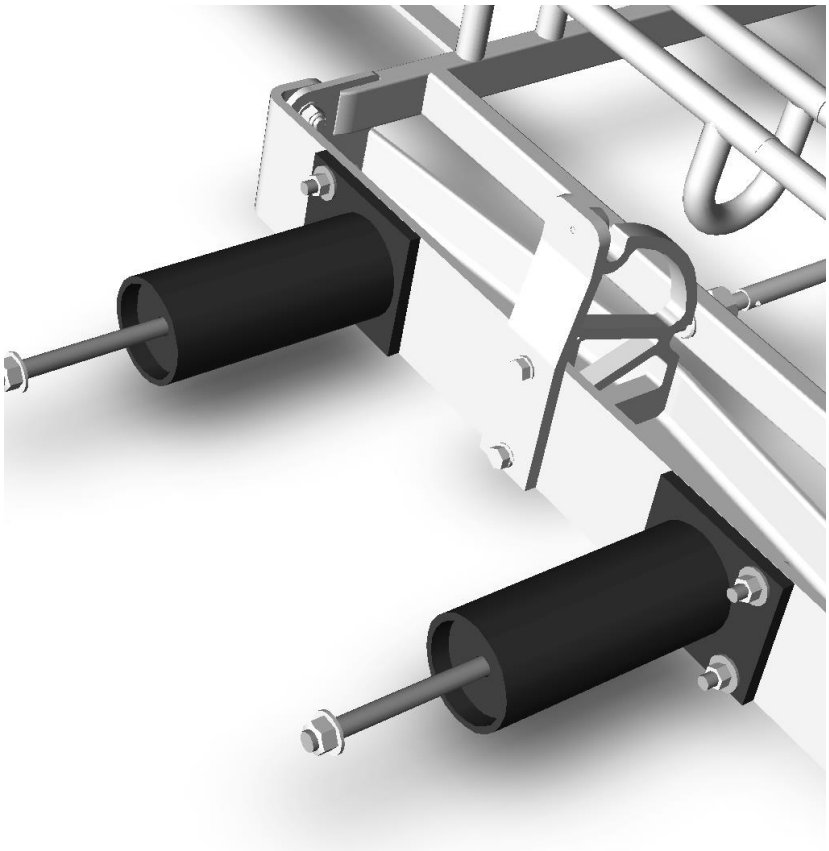
7) Torque Pivot Plate Assembly attachment bolts to 50-60 Ft-Lb (65-80 Nm)

8) Torque bumper/bracket attachment bolts to 65-80 Ft-Lb (90-110 Nm)

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE RACK** at the end of this section.

AMERICAN BUS INDUSTRIES (ABI)

BIKE-RACK BRACKET INSTALLATION; ABI TSV



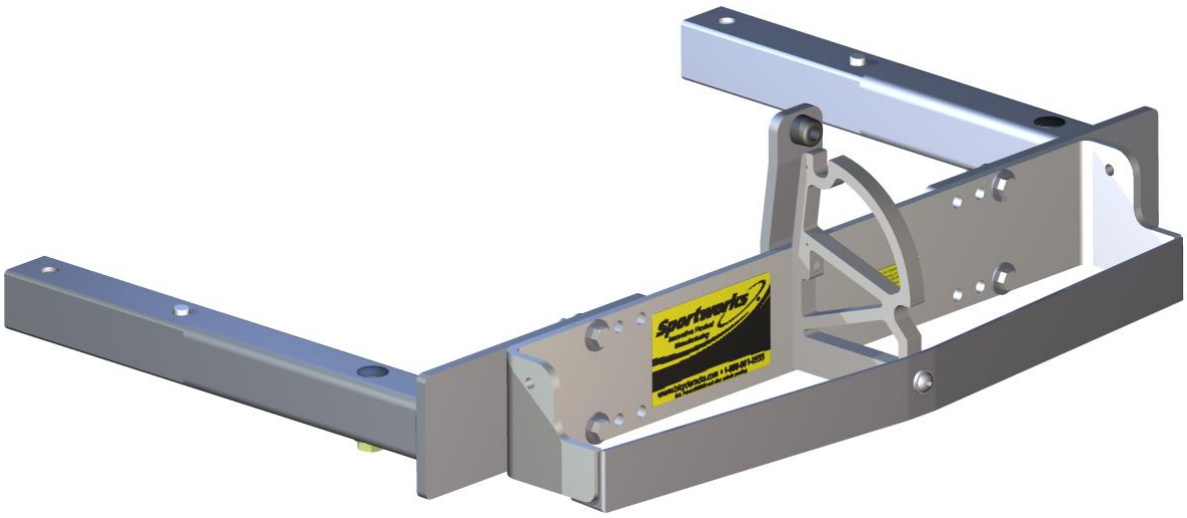
1) Attach bottom bracket mounting holes to top Pivot Plate mounting holes at 18” mounting location; align square.
2) Locate brackets against bumper. Use of a stand or adjustable rest is recommended in this step for one person installations. Center the brackets still attached to the pivot plate both vertically and horizontally on the bumper.
3) Use ½ inch drill and bracket as a template to spot drill the urethane.
4) Use 3” hole saw to create two holes thru urethane to expose back structure of the bumper.
5) Insert the brackets, still attached to the Pivot Plate into the two 3 inch holes. Note bracket may be tight fitting in the urethane.
6) Use long ½ inch bit and bracket as a template to drill thru the bumpers back structure.
7) Attach brackets to bumper with supplied ½” Hex Head Cap Screws. Re-attach Pivot Plate to bracket in their proper locations.
8) Torque ½-13 to 100-120 ft-lb, torque 3/8-16 to 30-40 ft lb.

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE RACK** at the end of this section.

CHANCE OPUS LF BIKE RACK INSTALLATION

1) Remove tow eye receiver cover from front bumper
2) Remove tow hooks from receivers
3) Place left and right brackets into tow eye receivers. Note hex head cap screws pointing downwards. Secure to bus using tow eye hitch pins.
4) Loosely mount pivot plate to brackets using supplied hardware
5) Tigheten anti-wobble bars, torque to 100-120 ft-lb
6) Secure pivot plate to brackets and torque to 50-60 ft-lb

You are now ready to install the Sportworks bike rack to the mounting bracket. Refer to **MOUNTING THE RACK** at the end of this section.



Ten Second Bracket Field Installation Instructions

Kit # 100722

(Tools needed are Wrenches for Bumper removal and Mag Base Drill)

This Kit includes a router with router bit, drill templates for Romeo Slide-In and Swept Bumpers, holes saw, step drill and clamps used with the drill template, router templates for Romeo Slide-In and Swept Bumpers, and a rivnut squeezer. The templates are stamped identified as Slide-In or Swept. Be sure to indentify your bumper type and use the correct templates. Use Kit P/N 100801, Ten Second Bracket Field Install, Slide-In Bumper (Set of Rivnuts and Clips for Slide-In Bumpers) and Kit P/N 100802, Ten Second Bracket Field Install, Swept Bumper (Set of Rivnuts) for Swept Bumpers. Removal and disassembly of the bus bumper, machining of the bumper module and back structure, and re-installation onto the bus will take 2-3 hours per bus.

1. Remove bumper from coach and setup on table or work bench.
2. Using tape measure, square, scribe or permanent marker mark center line of both the bumper back structure and the urethane module. These two must line back up during re-assembly.
3. Remove the bumper module from the back structure. **Slide-In:** First remove one corner module, using a putty knife break off the heads of the plastic christmas tree clips then with a drift drive the clips down out of the module and back structure. Slide off the corner module. Repeat for the center module. Reinstallation will require new Christmas tree clips included in the fastener kit P/N 100801. **Swept:** Remove one corner module then remove the center module. Both modules are attached with four #14 Self Tapping Screws. Re-use the screws.
4. Back Structure Machining:

Figure 1: Step Drilling Back Structure

   a. A Mag Base Drill is required for this machining. Sportworks Kit 100722 includes the ½" Diameter Dowel Pin, 0.687-0.937 Diameter Step Drill and the 1 15/16" Hole Saw needed.
   b. Secure to bench, install template on top surface and center to centerline mark with L shape center block. Use C-Shaped Clamp Blocks to secure template to Back Structure. See Figure 1.
   c. Use 0.687-0.937 Diameter Step Drill and drill bushings to located Mag Base Drill.

d. Drill 0.687 Diameter thru and spot face .937. Spot face should be 80-100% cleanup with minimal depth. See Figure 1
e. Repeat for second hole location.
f. Use ½" dowel and setup plate to locate the Mag Base Drill in the proper location for hole sawing, lock drill in place.

Figure 2: Aligning Mag Base Drill

Figure 3: Hole Sawing Back structure

g. Use 1 15/16" Diameter Hole Saw supplied with kit. Saw hole thru one wall of back structure.
h. Re-locate Mag Base Drill and saw 1 15/16" Diameter in second location.
i. Remove template
j. Debur holes with sandpaper, file or other deburing tool.

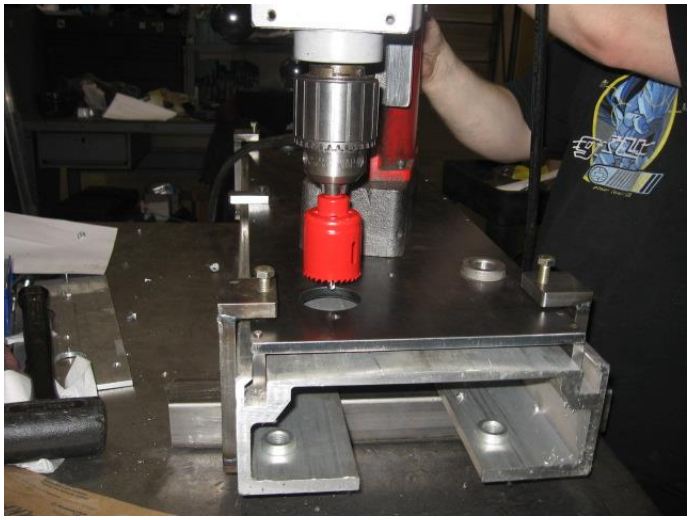
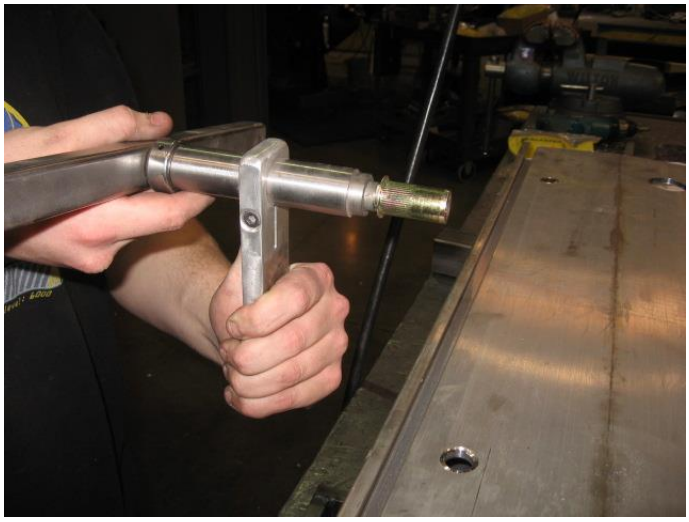


Figure 4: Back structure After Machining **Figure 5: Rivnut Tool**



h. Use Rivnut Installation Tool to install two ½-13 x ¼" Grip Rivnuts suppllied with kit.
i. Install Rivnuts two places with Rivnut Flange seated onto 0.937 Diameter Spot Face.
j. Install Rivnuts until swaged tight in place.

Figure 6: Rivnut Installation

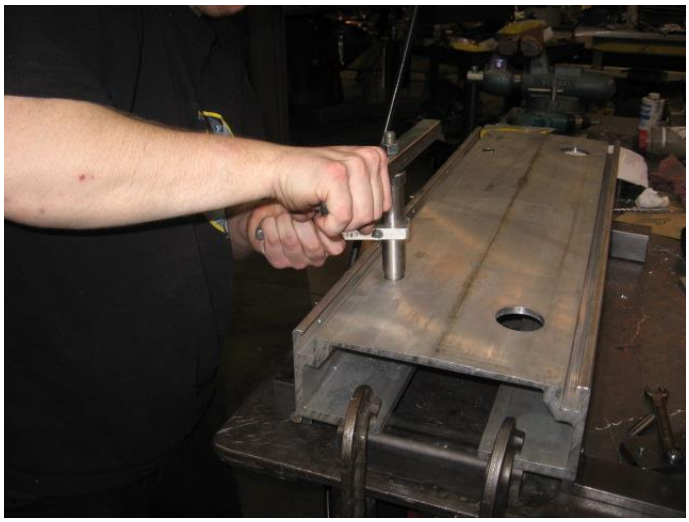


Figure 7: View of Backside of Rivnut Installed

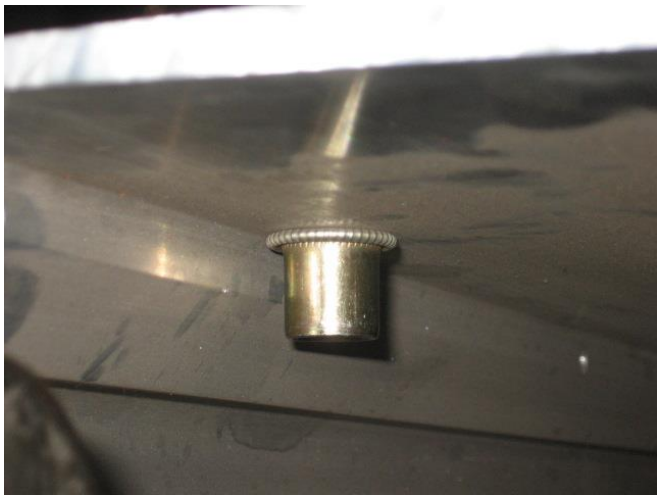


Figure 8: Pilot Drill for Routing Operation

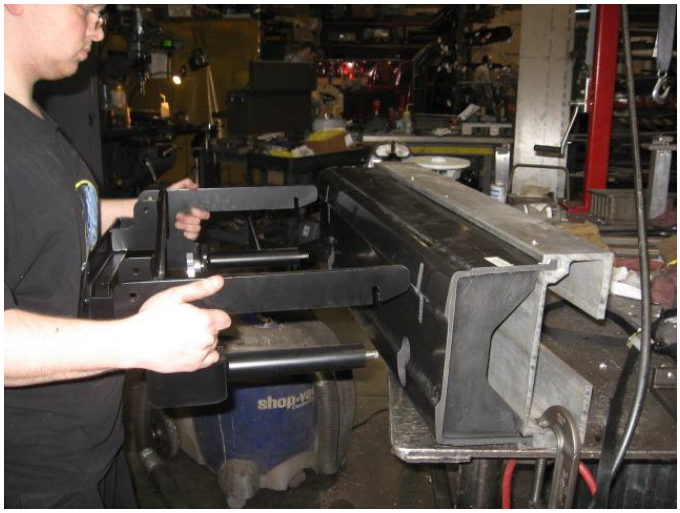
5. Module Routing:
    - **a.** Secure Urethane Module. Sliding it back into the back structure works well.
    - **b.** Install template. Line up centerline mark on module with template centering block.
    - **c.** Use strap or other method to secure template to the module
    - **d.** Use hand drill and 3/8” diameter drill to spot drill for routing. Spot drill in the center of the template cutouts. The slots in the module will be much smaller than the template cutouts.

Figure 9: Routing the Module

e. Use ¼” Diameter Router Bit supplied with kit and the router base. Attach the router base to your router. You may need to drill (3) 3/16” diameter holes to mount the base.
f. Start routing in spot drill locations to rout all four slots in module.
g. Use sand paper or other device to remove burrs along routed edges.
h. Remove template

Figure 10: View of Routed Module

Figure 11: Test Fitting Ten Second Bracket



i. Slide Center Module onto Back structure. Align center marks.
j. Test fit Ten Second Bracket to ensure that the Module and Back Structure are aligned properly.
k. Install new christmas tree pins included in kit. If new locations are necessary, drill 3/16” diameter thru module using the back structure as a template.
l. Install new christmas tree pins.
m. Install Corner module.

6. Re-mount bumper onto coach.

7. Slide in Ten Second Bracket angled up slightly then drop down when legs engage with back structure.

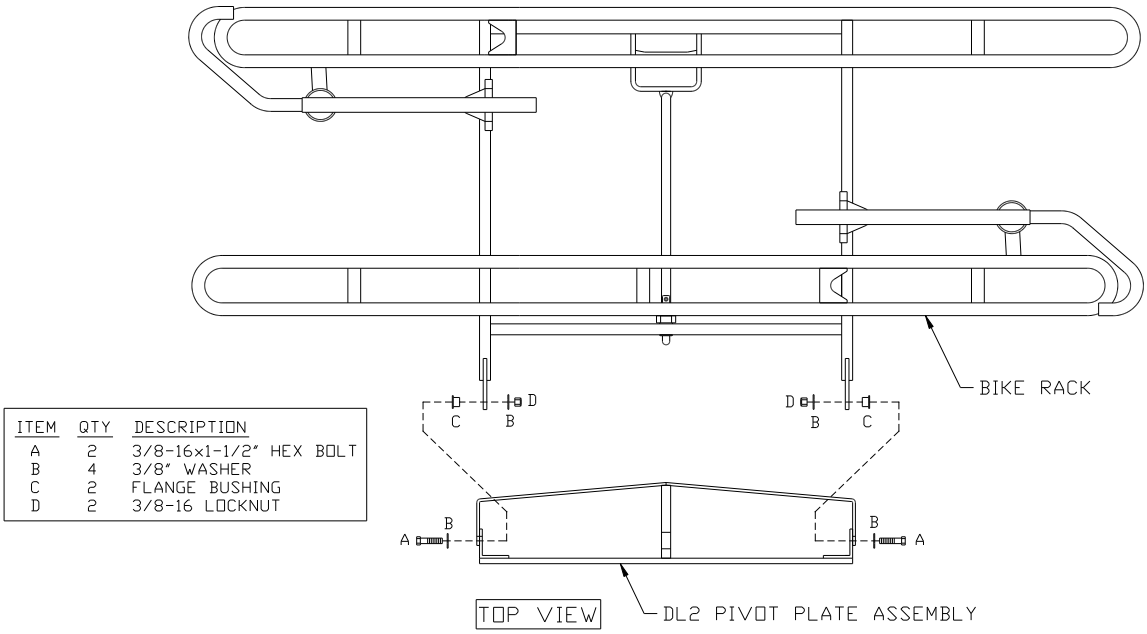
8. Tighten Hand Knobs just hand tight, insert Hair Cotter Pins.

Your Ten Second Bracket Installation is now complete!

Figure 12: Bumper Complete

MOUNTING THE BIKE RACK

Once a bracket has been properly mounted to a coach, the bike rack can be quickly installed. It only takes a few minutes to install the bike rack to the mounting bracket. See Figure 32 for the assembly of the bike rack to the pivot points on the pivot plate.



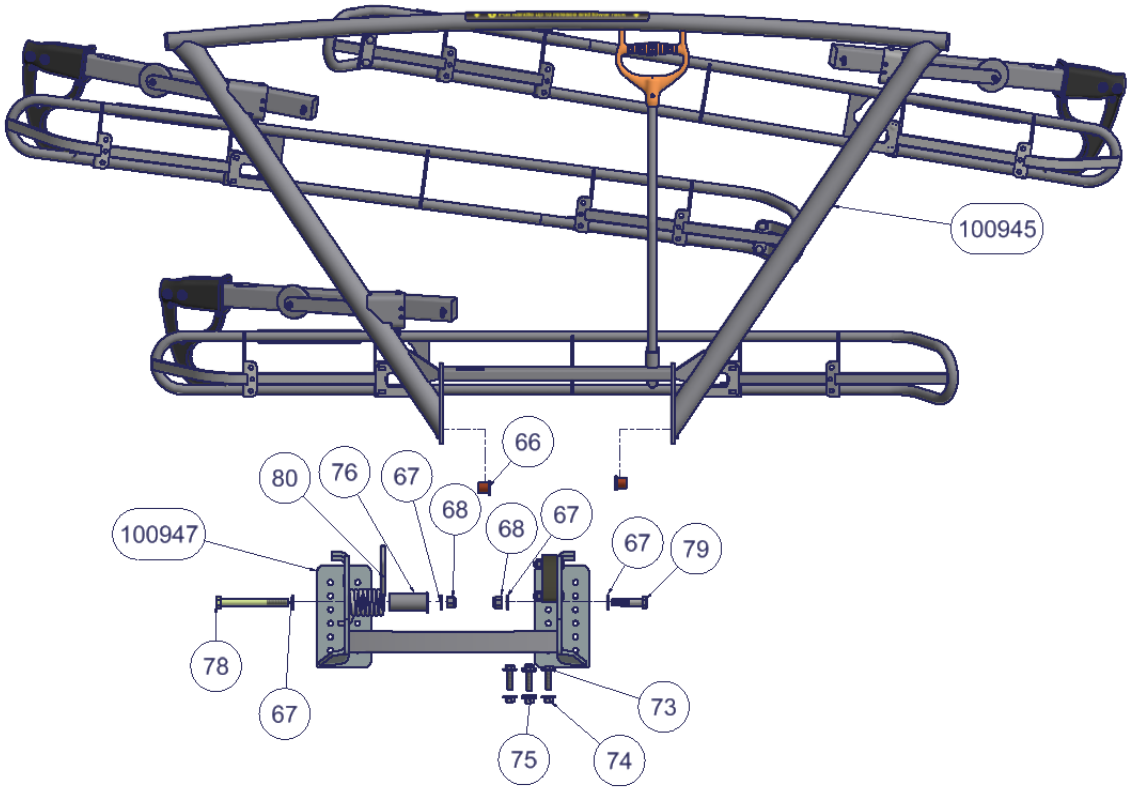
ITEM	QTY	DESCRIPTION
A	2	3/8-16x1-1/2" HEX BOLT
B	4	3/8" WASHER
C	2	FLANGE BUSHING
D	2	3/8-16 LOCKNUT

Installation **Fig. 32**

After mounting the bike rack at the pivot points, make sure the bike rack locks horizontally in the deployed position and locks vertically in the stored position. Check that the bike rack has free motion.

Refer to the "Installation - Overview" section of this chapter on page 2 to confirm the proper installation height of the Sportworks bike rack.

Mounting the Apex3



Apex 3

Installation Instructions

Note: Standoffs can shift during service because of impacts. When installing the Apex pivot plate on pre-installed standoffs, it may be necessary to loosen the standoffs from the back bumper structure in order to align them to the 14" and 18" hole pattern. Bolt the pivot plate to standoffs, and tighten standoff bolts.

1. Install pivot plate using supplied hardware (73, 74) and 14" or 18" hole pattern.
2. Install pivot tab bushings (66) in rack with flanges inside.
3. Place rack on pivot plate in stowed (up) position. The pivot plate will support the rack while you insert the fasteners.
4. Insert the supplied fasteners (79, 67, 67, 68).
5. Insert the supplied fasteners and torsion spring (78, 67, 80, 76, 67, 68). The bent end of the torsion spring hooks into the pivot plate and the large end of the torsion spring mount (76) should be toward the nut.
6. Torque 1/2"-13 bolts to 75 ft./lbs.

General Torque Specs

Most of our brackets are attached to the bus bumper using Grade 8 ½-13 HHCS.
Our standard pivot plates are attached to the brackets using Grade 8 3/3-16 HHCS.

The recommended torque values are:

For ½-13 Grade 8 = 110-130 FT-LB
For 3/8-16 Grade 8 = 50-60 FT-LB

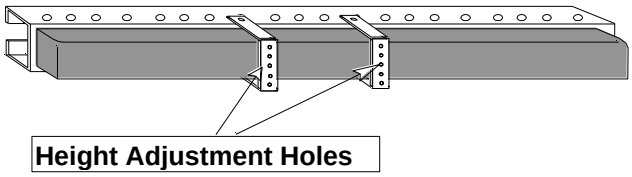
For the rack pivot bolts:
3/8-16 Stainless = 30-40 FT-LB

CHANGING THE POSITION OF THE RACK

TYPICAL HEIGHT ADJUSTMENT FOR ALL BUMPER TYPES

To change the position of the rack, remove the bike rack from the pivot plate. Remove the pivot plate from the C-Brackets or other bracket pieces and position the pivot plate up or down as required. Remount the pivot plate to the bracket pieces and the rack to the pivot plate.

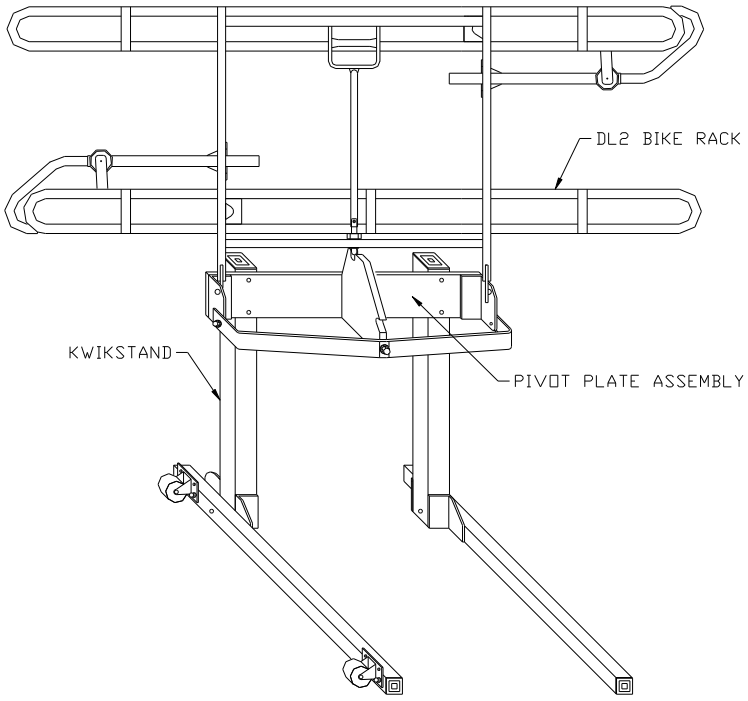
Some bracket assemblies may not have multiple height adjustment holes. If this is the case, the bracket assembly is designed for an optimum position in terms of minimal headlight interference and proper loading height. Height adjustment is not required.



Installation Fig. 33

DISPLAYING THE BIKE RACK

The Sportworks' Bike-Rack-for-Buses can be easily displayed using the Sportworks' KWIKSTAND. This bike rack show stand allows one to quickly and easily demonstrate the use and operation of the bike rack. The "hands on" experience benefits all those investigating the bike rack.



Installation Fig. 34

USES OF THE KWIKSTAND

Use the Kwikstand for:

- presentation at meetings, fairs, and shows
- training bus operators and mechanics
- educating customers

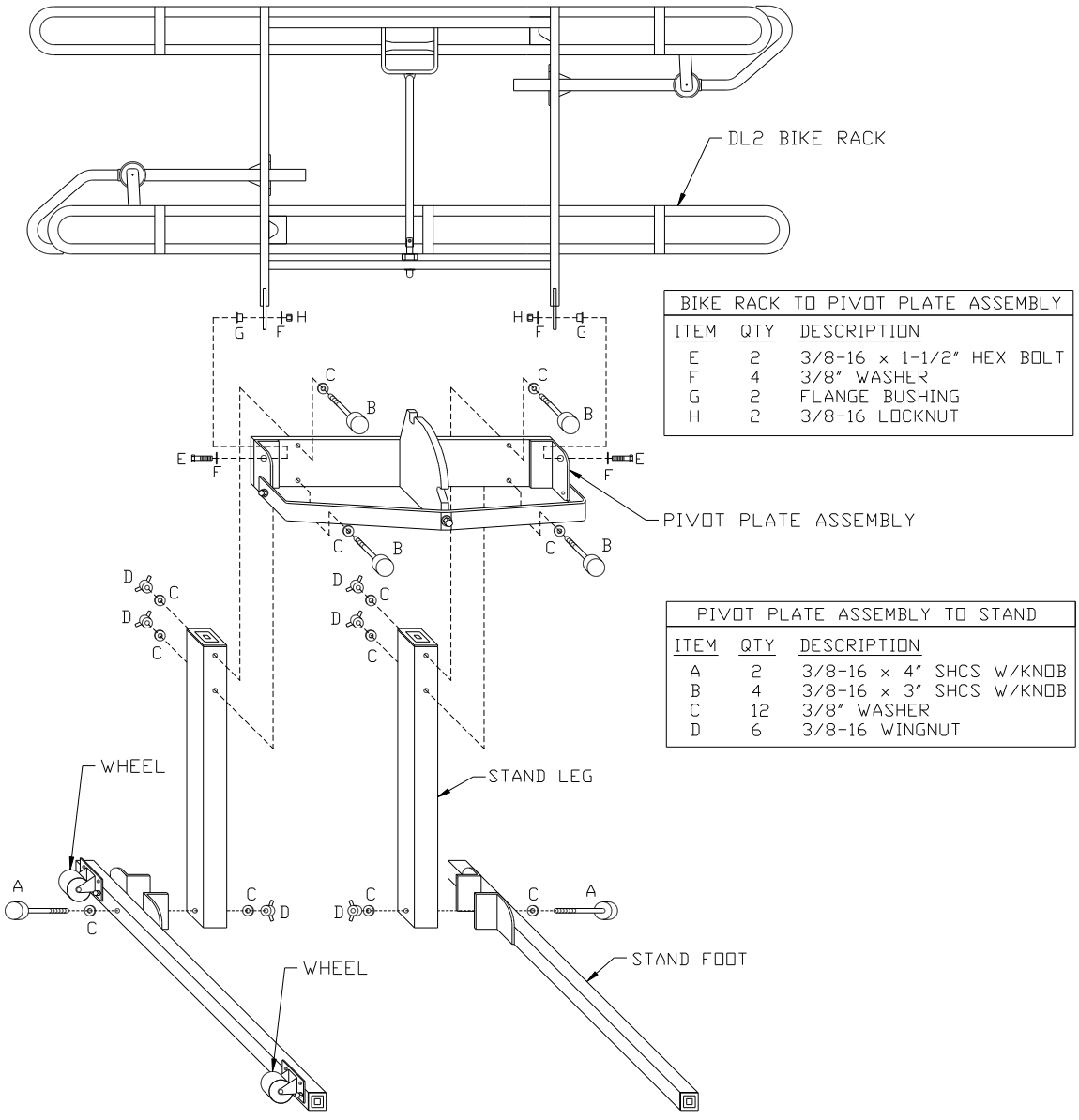
KWIKSTAND FEATURES

Some Kwikstand features include:

- compact design
- hand adjustable fasteners
- steel tubing construction with durable powder coat finish
- accommodation of all Sportworks' pivot plate assemblies and transit racks
- easy maneuverability

ASSEMBLY OF KWIKSTAND

Refer to Figure 35 to assemble the Kwikstand. The Kwikstand accommodates all Sportworks pivot plate assemblies and transit bike racks.



BIKE RACK TO PIVOT PLATE ASSEMBLY

ITEM	QTY	DESCRIPTION
E	2	3/8-16 x 1-1/2" HEX BOLT
F	4	3/8" WASHER
G	2	FLANGE BUSHING
H	2	3/8-16 LOCKNUT

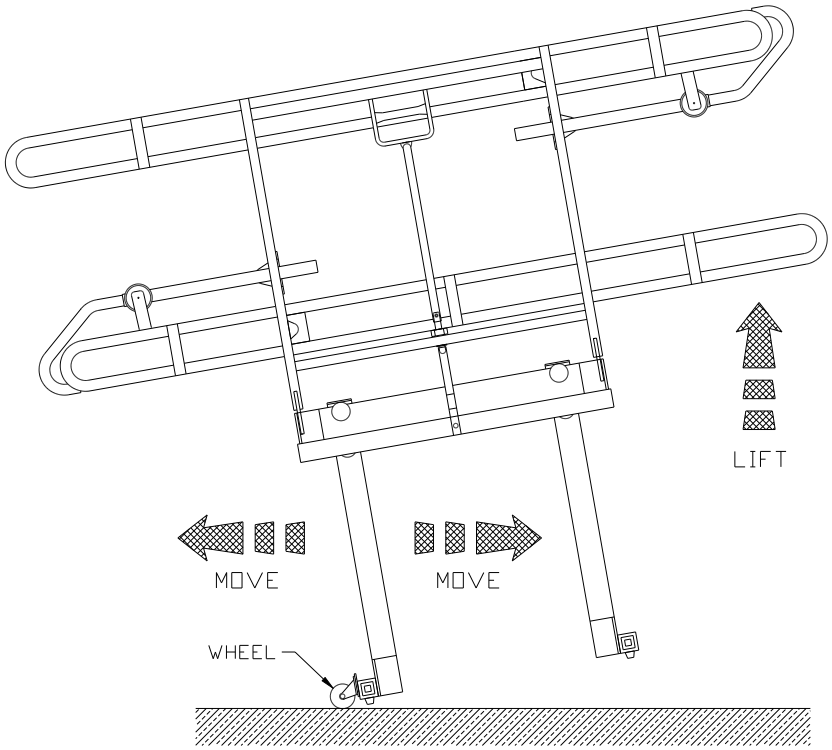
PIVOT PLATE ASSEMBLY TO STAND

ITEM	QTY	DESCRIPTION
A	2	3/8-16 x 4" SHCS W/KNOB
B	4	3/8-16 x 3" SHCS W/KNOB
C	12	3/8" WASHER
D	6	3/8-16 WINGNUT

Installation **Fig. 35**

MANEUVERING THE KWIKSTAND

To maneuver the Kwikstand, lift up on the attached bike rack and push in the preferred direction as illustrated in Figure 36.



Installation Fig. 36

OPERATION OF BIKE RACK

The Sportworks Bike-Rack-for-Buses has been designed to make as low an impact as possible on transit operations. All loading and unloading of bicycles can be done by the bicycle rider. Sportworks suggests that loading of children's bicycles be done by an accompanying adult, but the rack can be easily
loaded by young children.

These are the steps that should be followed when using the rack.

Loading Bikes

1. Prepare your bike for loading. Remove water bottles, pumps and other loose items that could fall off while the bus is in motion.

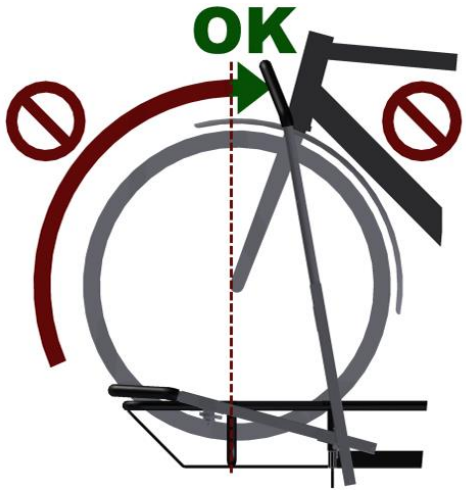
2. Inform the bus driver that you will be loading your bike. You must load your bike from the curb or in front of the bus. Do not step into oncoming traffic to load your bike.

3. Squeeze handle up to release latch, then fold down the bike rack. You only need to use one hand to unlatch and pull the bike rack down, so you can hold your bike with your other hand. It is not necessary to lean your bike against the bus.

4. Lift your bike onto the bike rack, fitting wheels into proper wheel slots. Each wheel slot is clearly labeled for the front wheel. The purpose of the directional placement is to make the bike nearest the bus easier to unload.

5. Raise the Support Arm over the front tire. The Support Arm's number one purpose is to add lateral support for the bicycle when the bus is in motion or at rest. Many bikes will sit in the wheel well without the use of the Support Arm, but the rack must not be used without the Support Arm. Bikes with especially thin rims and tires will sway back and forth without its use.

The handle should be placed as close to the front brake and head tube as possible to ensure safety and security of the bike, and in all cases the handle must be closer to the head tube than the highest point of the tire.



6. Board the bus and enjoy the ride! Choose a seat near the front of the bus to keep an eye on your bike. DON'T FORGET you have a bike with you when you get off at your stop. New riders often do!

Unloading Bikes

1. Inform the bus driver that you will be unloading your bike as you approach your stop. Use the front door to exit the bus. Unload your bike from in front of the bus or from the curb, not from the street.

2. Raise the Support Arm off the tire. The Support Arm automatically folds down to a secure position.

3. Lift your bike out of the bike rack.

4. Fold up the Bike-Rack-for Buses if there are no bikes on the rack and no one else is waiting to load their bike. The bike rack locks in place.

5. Step away from the bus with your bike.

PLEASE NOTE THAT LOADING OR UNLOADING A BICYCLE FROM THE STREET SIDE MAY CAUSE INJURY OR DEATH.

BUS WASHING

The Sportworks Bike-Rack-For-Buses has been designed to safely pass through bus wash facilities.

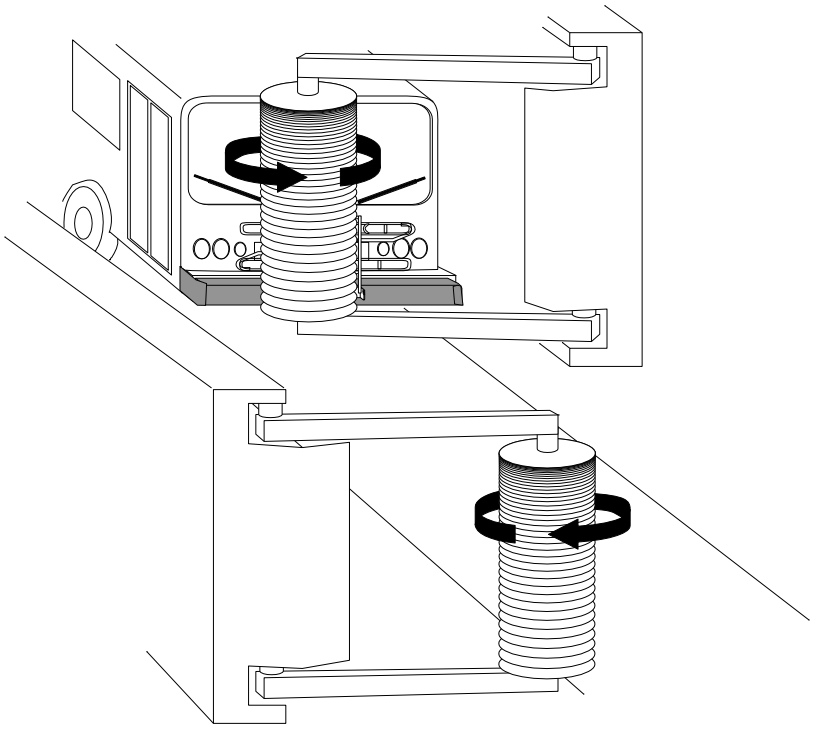
Before taking a newly mounted bike rack through a wash facility, the operator should check to ensure that the wash facility is properly set up for washing the bus with a rack on it.

Most wash systems use either a "top fixed" or "top and bottom fixed" spinning brush system. The Sportworks rack has been designed with round tubing and round edges so that the wash brushes address surfaces that will not catch or tear them.

Four types of conditions may cause excessive wear or harm to the bike rack or the wash system. None of these conditions should exist when running a bus with a bike rack through the wash facility:

1. The brushes are spinning at too slow of an RPM. This condition may allow the brushes to hook on protruding objects such as rear view mirrors. If the axle of the brush assembly pushes deep against the rack or any part of the bus that has any sort of ledge, it may become caught there.

2. The bus is traveling too fast through the wash system. This may cause the same type of damage as stated in number one, above.



Bus Washing Fig. 1

3. The brush density is too low. There is less than the recommended number of brushes on the brush arm assembly. This is usually found when well worn brushes are used for too long of a period.

4. The brushes are being turned into the bus path. Make sure the brushes are spinning so that they tend to climb up and over any protrusions they could catch on. See Figure 1. The illustration shows the recommended rotation for the brush assemblies. If the brush assembly is fixtured to the driver's side, the brush needs to rotate counter-clockwise, as viewed from the top. If the brush assembly is mounted on the curb side, the brush assembly would need to rotate clockwise.

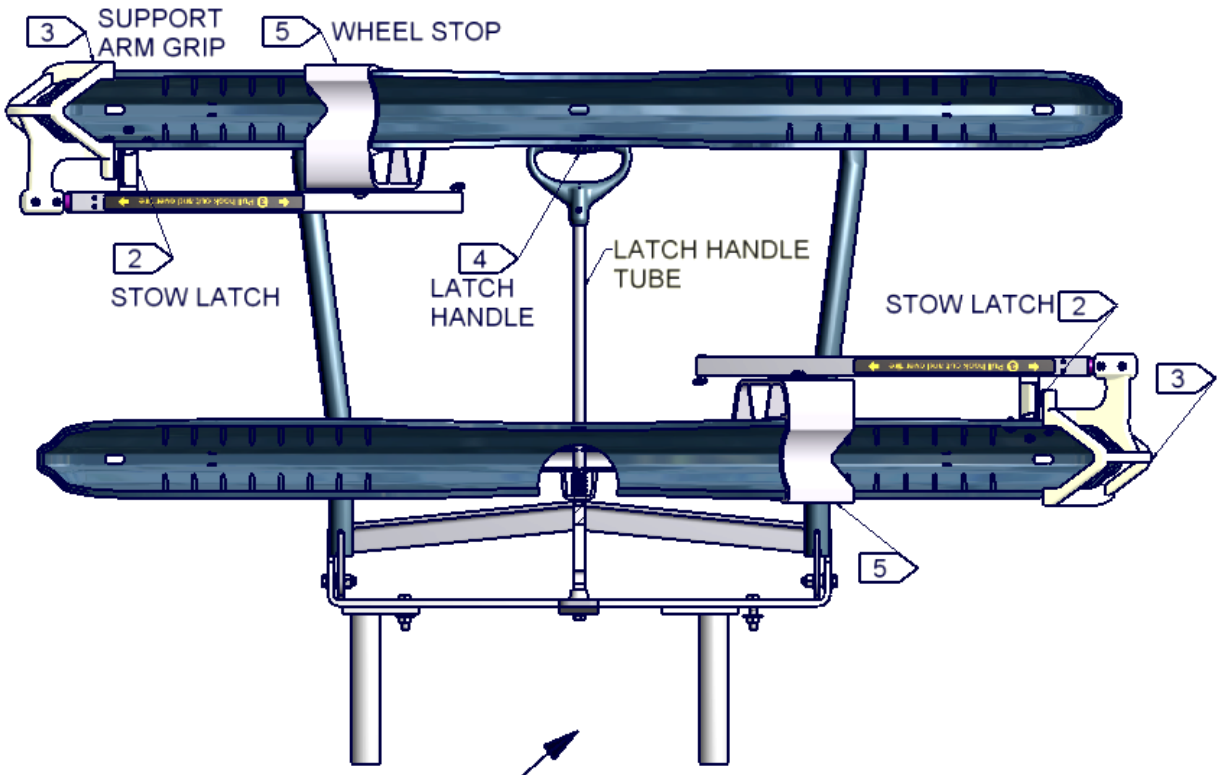
When operating the wash facility in the recommended way, one should find no deterioration above regular wear and tear to the bus, the bike rack and the wash system. If this is not so, take time to examine the rack setup on the bus and the setup of the wash facility. Please consult Sportworks at 425-483-7000 if you are experiencing any further problems.

SERVICE AND MAINTENANCE GUIDE

VELOPORTER 2

FIG 1: VELOPORTER BIKE RACK VISUAL INSPECTION

Top View



Side View

VELOPORTER BIKE RACK VISUAL INSPECTION

Sportworks recommends the following quick visual inspection to ensure an operable bike rack. Use this page as an inspection sheet for your transit operators.

Examine the items below before operating your coach. If the bike rack does not function properly, service it before putting it into operation.

1)_____√BOLTS ARE PRESENT—SECURE SUPPORT ARMS TO FRAME (2 PLACES)
Replace missing bolts.

2._____√STOW LATCH IS PRESENT (2 PLACES)
Replace if missing. These Latches stow the hook arms.

3.)_____√SUPPORT ARMS SLIDE IN/ OUT (2 PLACES)
Handles move smoothly in/out and self stows on latch.
DO NOT LUBRICATE

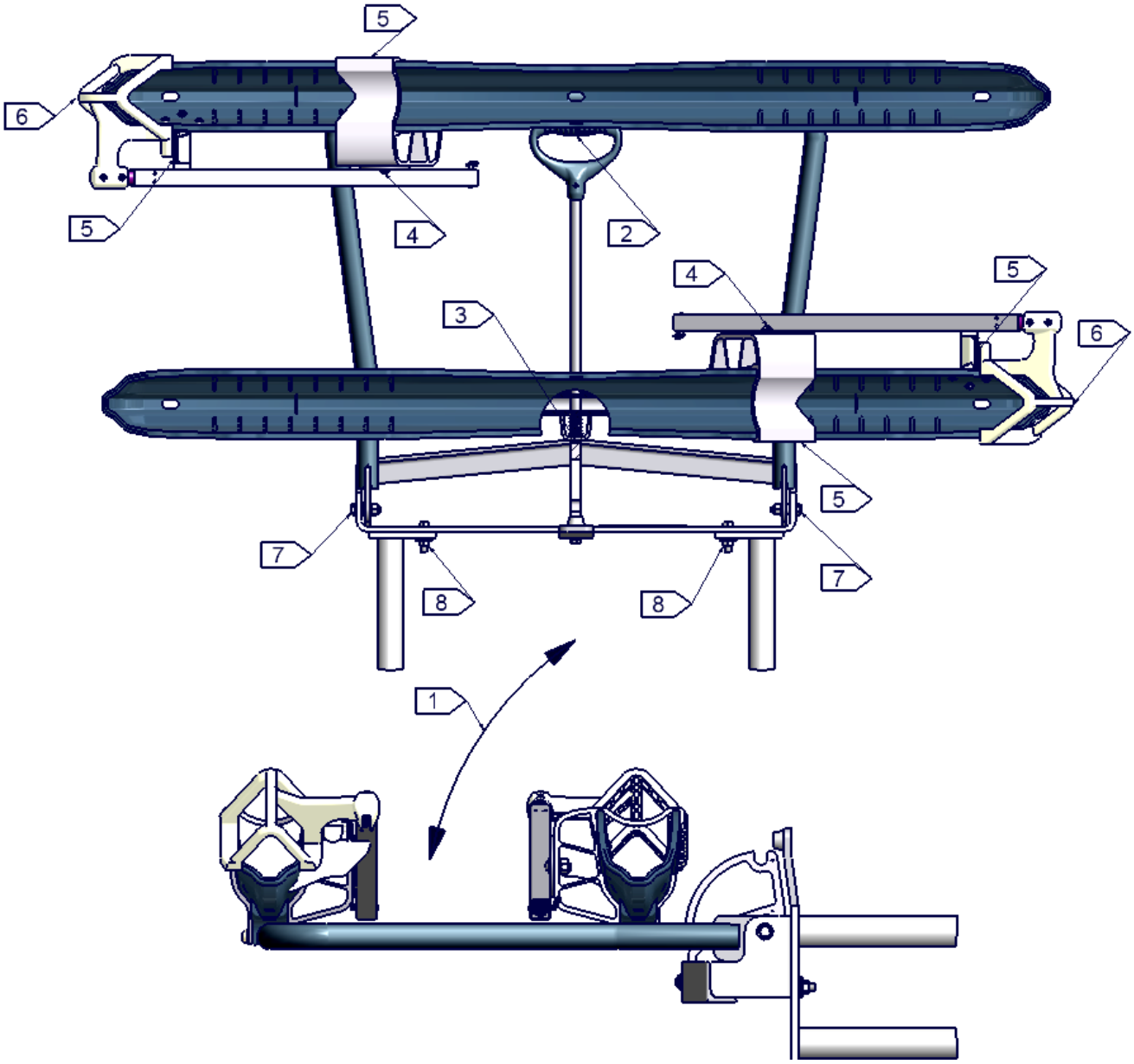
4.)_____√LATCH HANDLE WORKS
Latch is easy to engage and release.

5.)_____√WHEEL STOP IS SECURE
Tighten Phillips 5/16-18 screws as necessary.

6.)_____√BIKE RACK SWINGS FREELY AND LOCKS IN TWO POSITIONS
Rack pivots and locks in both the deployed and stowed positions.

VELOPORTER MAINTENANCE

Fig 2: The V2 and its accompanying brackets require very little service. Regular suggested maintenance checks are included below.



30 DAY GENERAL MAINTENANCE INSPECTION & SERVICE

Check every 30 days to insure that:

1. The rack swings freely and smoothly between the deployed and stowed positions.

2. The latch handle easily unlatches and does not stick in the release position.

3. The latch handle automatically locks the rack in place when moved to the deployed or stowed positions.

4. Each support arm hinge allows the support arm to raise and lower without undue constraint or too much play.

5. Each support arm stow latch properly mates with and holds the support arm grip.

6. Each support arm grip pulls out smoothly to the end stop, and easily slides back into the stored position, and properly self stows on the stow latch when it is released. DO NOT LUBRICATE.

7. Both pivot bolt assemblies are tight. If you see excessive wear or cracks in the bronze oilite bushings you must replace them immediately. Some cutaway vehicles tend to cause the bushings to wear more quickly. You can replace the originals with our heavy duty pivot bolt kit P/N 100839 for longer life.

8. All fasteners are tight on the mounting bracket, including the hardware for the quadrant, pivot plate to bracket pieces, and bracket pieces to bumper or coach body.

9. The instruction labels on the rack are intact. Replace if shredded, partially removed, non-readable, or not adhering properly. Clean the rack surface thoroughly (isopropyl alcohol) before replacing.

SERVICING

In addition to the 30 day general maintenance and service inspections, there are more specific service guidelines to follow in maintaining the Sportworks' bike rack. The guidelines are easy to follow and should be done so every 30 days. If there are problems with the bike rack or mounting bracket, replace or repair them to proper working order and return them to service. Contact Sportworks for parts.

SERVICING THE VELOPORTER BIKE RACK

Service every 30 days

1) If the bike rack is not raising and lowering with ease, check the two pivot bolt assemblies for incorrect installation or wear. Replace the assemblies if damaged. Check that the pivot tabs are straight and aligned to properly pivot the bike rack. Straighten the tabs as required.

2) Check the pivot plate for correct alignment and damage. Remove and straighten the pivot plate if it is not straight.

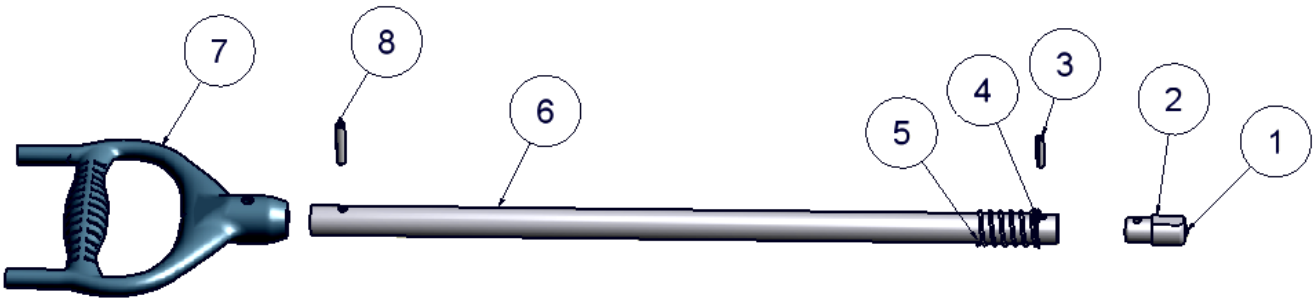
3) Check the stow latch and the support arm grip latching teeth. If they are broken or worn, replace the necessary parts.

4) Check the wheel stop for damage. Replace if necessary.

5) Check the urethane wheel wells for cracks or damage. Replace if necessary. To replace, remove the six screws attaching the tray to the frame. The tray engages with two sleeves in the location of the wheel stop. Use a screw driver or small pry bar to spread the tray flanges off the two sleeves. Slide the wheel stop off of the tray. Reverse steps for installation of the new tray.

6) Examine the structural integrity of the round tubing of the main frame. Repair or replace the bike rack if damaged.

FIG 3: SERVICING THE VELOPORTER LATCH HANDLE
Service every 30 days



Assembly Parts List			
ITEM	QTY	PART#	TITLE
1	1	7098	LATCH PIN RIVET
2	1	9651	VeloPorter Latch Pin
3	1	7072	PIN, ROLL 5/32 X .75,SS
4	1	9656	Washer, 0.631 ID x 0.812 OD x .030, SS
5	1	9657	Spring, 0.626 ID x 0.750 OD x 1.250 x .062 SS Wire
6	1	9650	VeloPorter Latch Handle Tube
7	1	9661	VeloPorter Latch Handle
8	1	9668	Type 420 Stainless Steel Spring Pin 3/16" Diameter, 1" Length

****NOTE: PLEASE ASK SALES FOR 6 DIGIT FINISHED GOODS P/N**

1) Check that the latch handle for damage. Replace if necessary.

2) Check the latch handle tube for straightness. Straighten or replace if necessary.

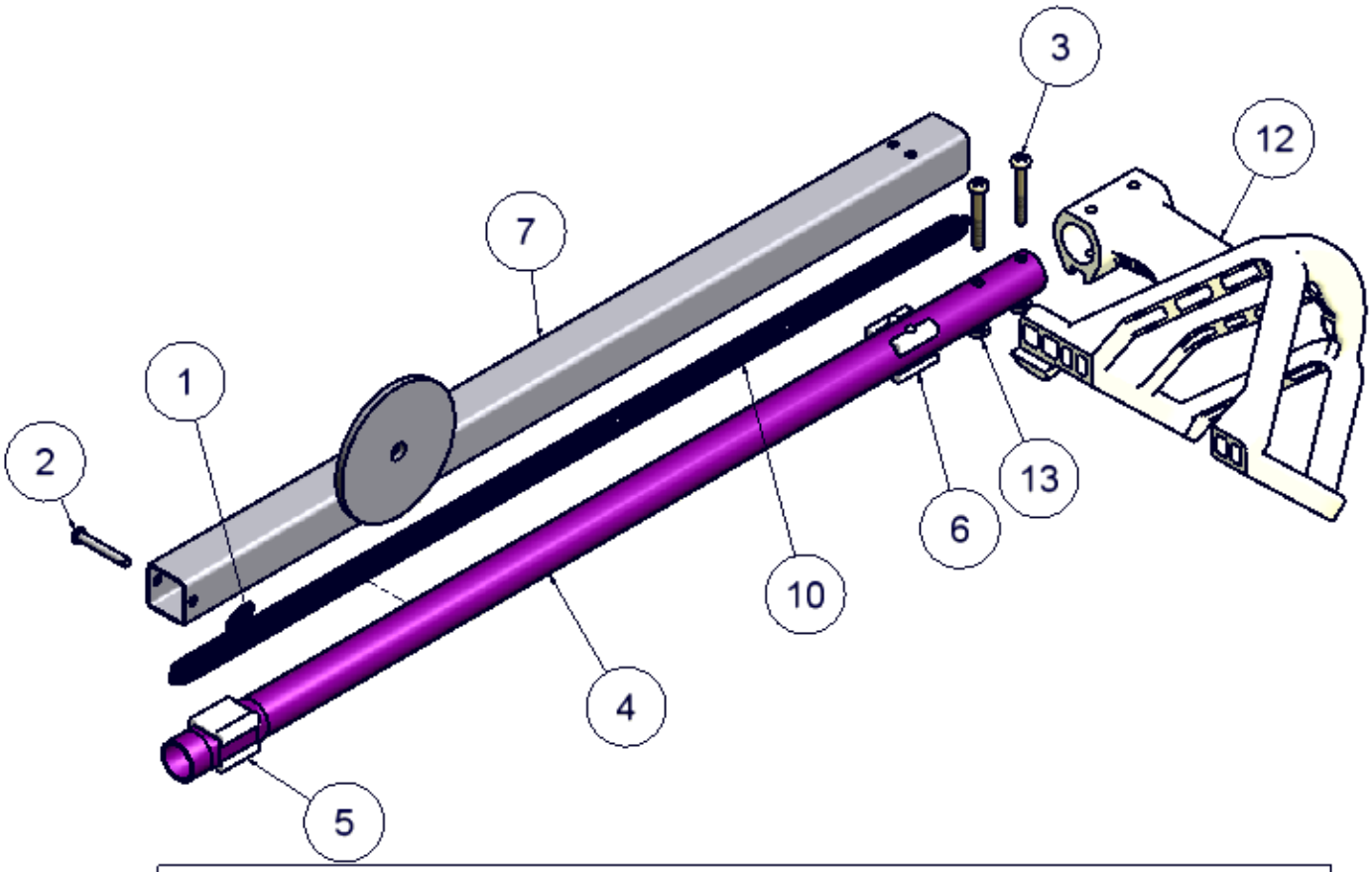
3) Examine the wear of the plastic insert in the tip of the latch pin. Replace the insert if the quadrant is being marred by the latch pin.

4) If the latch pin does not properly track on the quadrant, check that the quadrant is attached tightly and squarely to the pivot plate. Replace the quadrant if damaged.

5) Examine latch components:

   a) Check that the roll pin fixing the return spring is fully engaged.
   b) Check the wear on the spring. Clean the spring and replace it if it is distorted or not functioning properly.
   c) Check the latch pin housing for damage.

FIG 4: SERVICING THE VELOPORTER SUPPORT ARM ASSEMBLY



Assembly Parts List			
ITEM	QTY	PART#	TITLE
1	1	7302	RING, SPLIT, .670 O.D. X .051 WIRE DIA, SS
2	1	7299	PIN, CLEVIS, 3/16 X 1 1/4 SS
3	2	9655	18-8 SS Pan Head Phillips Machine Screw 10-32 Thread, 1-3/8" Length
4	1	9644	VeloPorter Support Arm Spar
5	2	9646	VeloPorter Lower Bushing
6	4	9645	VeloPorter Upper Bushing
7	1	9641-PEN	VeloPorter Support Arm Housing Anti Glare
10	9	9662	CUSTOM SS SPRING
12	1	9647	VeloPorter Support Arm Grip
13	2	9793	18-8 Stainless Steel Toplock Locknut Hex, 10-32 Screw Size, 3/8" Width, 1/8" Height

****NOTE: PLEASE ASK SALES FOR 6 DIGIT FINISHED GOODS P/N**

1) Examine the components inside of the support arm assembly.

   a) Remove the bolts attaching the support arm assembly to wheel stop.

   b) Remove the support arm grip. Note. The lower Phillips screw fixes one end of the spring. Remove the roll pin from the base of the support arm housing. This fixes the other end of the spring.

   c) Carefully slide the support arm spar out from the bottom end of the support arm housing. Make note of how the two nylon slider bushings fit at the base of the support arm spar. Also note that the four upper bushings engage into the four holes in the housing. Re-assembling the upper bushings may require some practice.

   d) Remove the roll pin on the support arm housing to free the support arm spring. Clean the spring and examine it for wear, overstress, and cyclical fatigue. Pay special attention to the end hooks of the spring. Replace the spring as necessary.

   e) Clean the inside of the stainless steel support arm housing using a stainless steel brush. Do not use a non-stainless wire brush.

   f) Examine the upper and lower bushings. Replace them if they are excessively worn or marred. Replace them if the support arm spar is not tracking correctly (i.e. there is too much twist).

   g) Re-assemble the support arm assembly in the reverse order of steps a-d. Use a simple hook made of stiff wire or similar tool to pull the spring into position when re-inserting the roll pin through the base of the support arm housing and the end hook of the spring.

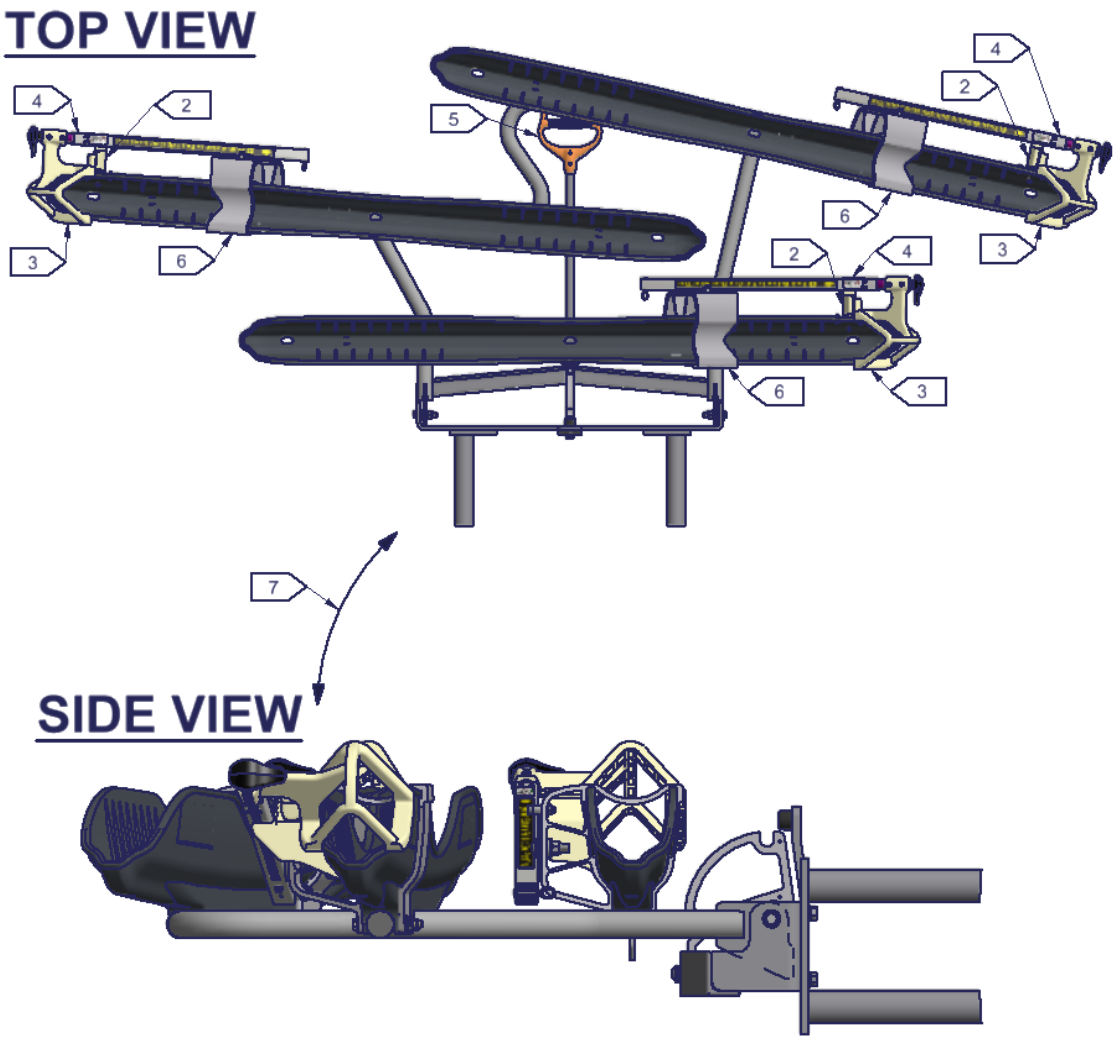
   i) Check the operation of the support arm assembly once again. Each support arm hook should pull out smoothly, stop at the stop screw, easily slide back into the stored position, and properly self stow when it is released.

2) If the support arm spar is bent it should be replaced.

3) Examine the support arm assembly mounting pivot. Check the pivot for side play. Side play can be adjusted by tightening the 3/8-16 nylock nut. Do not over tighten. The pivot should be free with a small amount of play. With the support arm assembly vertical and fully retracted lightly push the grip towards the front of the bus and then away from the bus. If total movement exceeds 2”, replace the worn parts. DO NOT LUBRICATE.

VELOPORTER 3

FIG 1: VELOPORTER 3 BIKE RACK VISUAL INSPECTION



VELOPORTER BIKE RACK VISUAL INSPECTION

Sportworks recommends the following quick visual inspection to ensure an operable bike rack. Use this page as an inspection sheet for your transit operators.

Examine the items below before operating your coach. If the bike rack does not function properly, service it before putting it into operation.

1) _____√ BOLTS ARE PRESENT—SECURE SUPPORT ARMS TO FRAME (3 PLACES)
Replace missing bolts.

2._____√ STOW LATCH IS PRESENT (3 PLACES)
Replace if missing. These Latches stow the hook arms.

3.) _____√ SUPPORT ARM GRIP (3 PLACES)
Replace Grip if damaged or cracked

4.A) _____√SUPPORT ARMS SLIDE IN/ OUT (3 PLACES)
Handles move smoothly in/out and ratchets work properly.
DO NOT LUBRICATE

4.B) _____√SUPPORT ARMS SELF STOW (3 PLACES)
Support Arms should rotate freely and drop and engage with Stow Stop when raised six inches. Side to side play should be just enough to rotate freely.

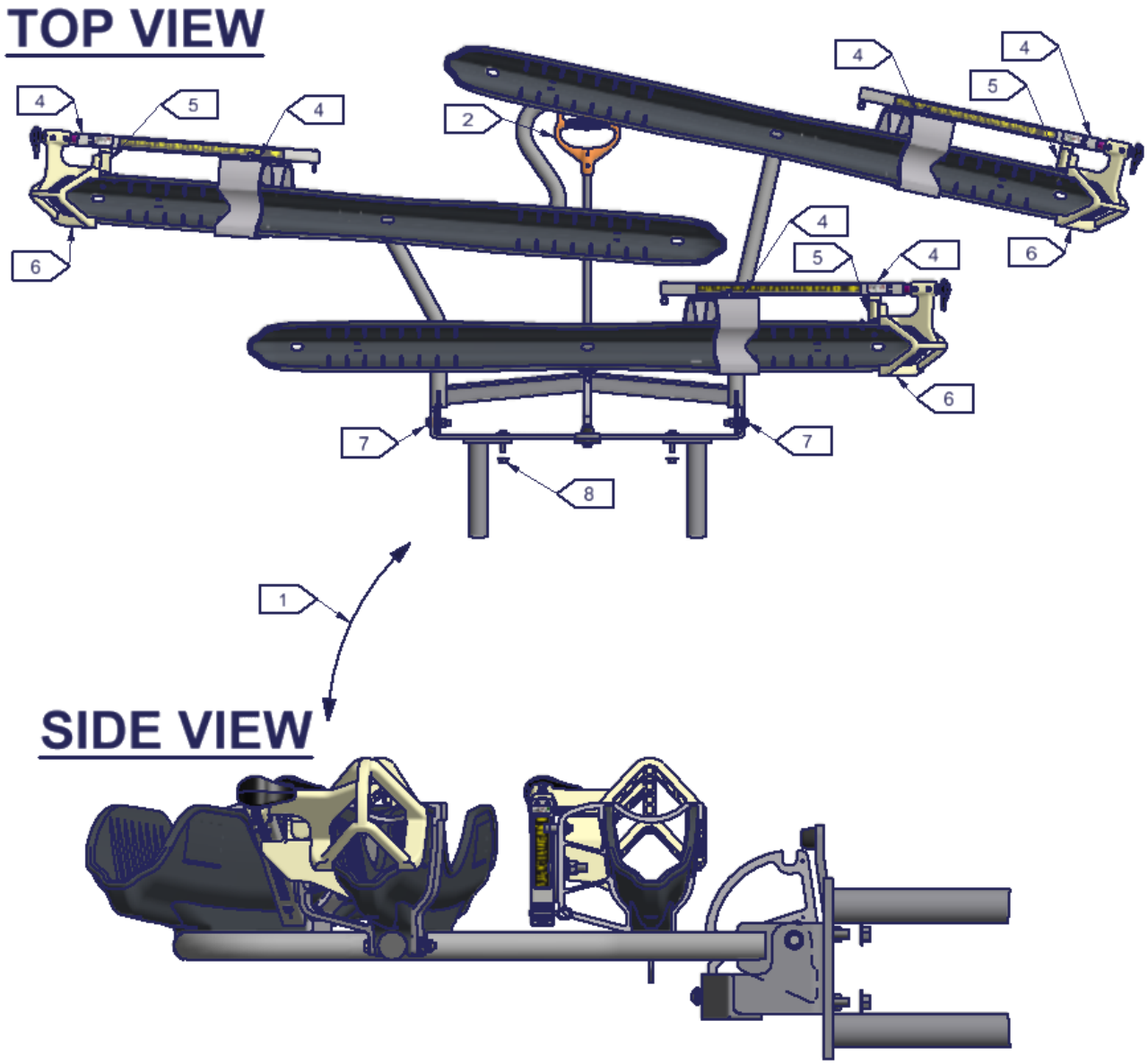
5.) _____√LATCH HANDLE WORKS
Latch is easy to engage and release.

6.) _____√WHEEL STOP IS SECURE
Tighten Phillips 5/16-18 screws as necessary.

7.) _____√BIKE RACK SWINGS FREELY AND LOCKS IN TWO POSITIONS
Rack pivots and locks in both the deployed and stowed positions.

VELOPORTER 3 MAINTENANCE

Fig 2: The V3 and its accompanying brackets require very little service. Regular suggested maintenance checks are included below.



30 DAY GENERAL MAINTENANCE INSPECTION & SERVICE

Check every 30 days to insure that:

1. The rack swings freely and smoothly between the deployed and stowed positions.

2. The latch handle easily unlatches and does not stick in the release position.

3. The latch handle automatically locks the rack in place when moved to the deployed or stowed positions.

4. Each support arm hinge allows the support arm to raise and lower without undue constraint or too much play.

5. Each support arm stow latch properly mates with and holds the support arm grip.

6. Support Arm Ratchet Knob depresses and returns freely. With ratchet knob depressed each support arm pulls out smoothly to the end stop, and easily slides back into the stored position. Ratchet buttons engage and disengage with support arm house when ratchet knob is activated. DO NOT LUBRICATE.

7. Both pivot bolt assemblies are tight. If you see excessive wear or cracks in the bronze oilite bushings you must replace them immediately. Some cutaway vehicles tend to cause the bushings to wear more quickly. You can replace the originals with our heavy duty pivot bolt kit P/N 100839 for longer life.

8. All fasteners are tight on the mounting bracket, including the hardware for the quadrant, pivot plate to bracket pieces, and bracket pieces to bumper or coach body.

10. The instruction labels on the rack are intact. Replace if shredded, partially removed, non-readable, or not adhering properly. Clean the rack surface thoroughly (isopropyl alcohol) before replacing.

SERVICING

In addition to the 30 day general maintenance and service inspections, there are more specific service guidelines to follow in maintaining the Sportworks' bike rack. The guidelines are easy to follow and should be done so every 30 days. If there are problems with the bike rack or mounting bracket, replace or repair them to proper working order and return them to service. Contact Sportworks for parts.

SERVICING THE VELOPORTER 3 BIKE RACK

Service every 6 months days

1) If the bike rack is not raising and lowering with ease, check the two pivot bolt assemblies for incorrect installation or wear. Replace the assemblies if damaged. Check that the pivot tabs are straight and aligned to properly pivot the bike rack. Straighten the tabs as required.

2) Check the pivot plate for correct alignment and damage. Remove and straighten the pivot plate if it is not straight.

3) Check the stow latch and the support arm grip latching teeth. If they are broken or worn, replace the necessary parts.

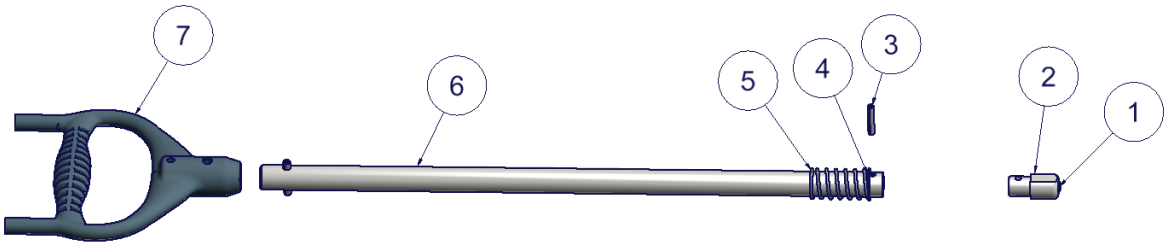
4) Check the wheel stop for damage. Replace if necessary.

5) Check the urethane wheel wells for cracks or damage. Replace if necessary. To replace, remove the six screws attaching the tray to the frame. The tray engages with two sleeves in the location of the wheel stop. Use a screw driver or small pry

bar to spread the tray flanges off the two sleeves. Slide the wheel stop off of the tray. Reverse steps for installation of the new tray.

6) Examine the structural integrity of the round tubing of the main frame. Repair or replace the bike rack if damaged.

FIG 3: SERVICING THE VELOPORTER 3 LATCH HANDLE
Service every 6 months



Assembly Parts List			
ITEM	QTY	PART#	TITLE
1	1	7098	LATCH PIN RIVET
2	1	9651	VeloPorter Latch Pin
3	1	7072	PIN, ROLL, .15625 OD x .875, 18-8 Stainless
4	1	9656	Washer, 0.631 ID x 0.812 OD x .030, SS
5	1	9657	SPRING, .640 ID x .070 WIRE x 1.5L, Stainless, for Veloporter Latch
6	1	9978	VeloPorter 3 Latch Handle Tube
7	1	9661	VeloPorter Latch Handle
9	1	7014	PIN, ROLL 3/16 X 1 SS

****NOTE: REPLACEMENT P/N FOR LATCH HANDLE IS 100704****

1) Check that the latch handle for damage. Replace if necessary.

2) Check the latch handle tube for straightness. Straighten or replace if necessary.

3) Examine the wear of the plastic insert in the tip of the latch pin. Replace the insert if the quadrant is being marred by the latch pin.

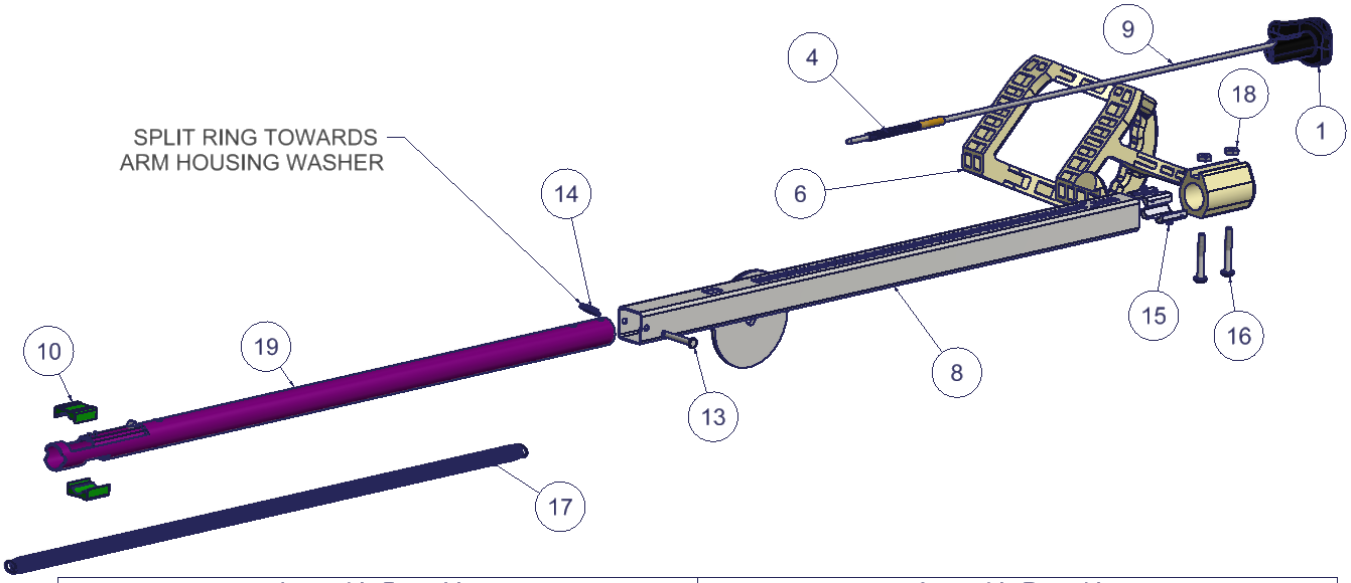
4) If the latch pin does not properly track on the quadrant, check that the quadrant is attached tightly and squarely to the pivot plate. Replace the quadrant if damaged.

5) Examine latch components:

   a) Check that the roll pin fixing the return spring is fully engaged.

b) Check the wear on the spring. Clean the spring and replace it if it is distorted or not functioning properly.
c) Check the latch pin housing for damage.

FIG 4: SERVICING THE VELOPORTER RATCHET SUPPORT ARM ASSEMBLY
Service every 6 months



Assembly Parts List			
ITEM	QTY	PART#	TITLE
6	1	3359	Veloporter Ratchet Arm Grip
8	1	3363-PEN	VeloPorter Support Arm Housing Anti Glare
9	1	3368	Ratchet Arm Release Rod Assembly
10	2	3390	VELOPORTER RATCHET ARM LOWER BUSHING
13	1	7299	PIN, CLEVIS, 3/16 X 1 1/4 SS
14	1	7302	RING, SPLIT, .670 O.D. X .051 WIRE DIA, SS
19	1	3464	Ratchet Spar Sub Assembly

Assembly Parts List			
ITEM	QTY	PART#	TITLE
15	4	9645	VeloPorter Upper Bushing
16	2	9655	18-8 SS Pan Head Phillips Machine Screw 10-32 Thread, 1-3/8" Length
17	1	3573	SPRING, Extension, V3 Ratchet Support Arm Spring
4	1	3354	Ratchet Arm Release Rod Return Spring, SS, 0.24 OD X .035 WIRE X 2.50 length, 7.4 lb/in rate
18	2	9793	18-8 Stainless Steel Toplock Locknut Hex, 10-32 Screw Size, 3/8" Width, 1/8" Height
1	1	3347	V3 Ratchet Arm Release Knob

****NOTE: PLEASE ASK SALES FOR 6 DIGIT FINISHED GOODS P/N**

1) Examine the components inside of the support arm assembly.

   a) Remove the bolts attaching the support arm assembly to wheel stop.

   b) Remove the ratchet knob taking care not to lose the small spring on the end of the rod. Note. The upper Phillips screw fixes the ratchet knob, the lower Phillips screw fixes one end of the spring. Remove the roll pin from the base of the support arm housing. This fixes the other end of the spring.

   c) Carefully slide the support arm spar out from the bottom end of the support arm housing. Make note of how the two nylon slider bushings fit at the base of the support arm spar. Also note that the four upper bushings engage into the four holes in the housing. Re-assembling the upper bushings may require some practice.

   d) Remove the roll pin on the support arm housing to free the support arm spring. Clean the spring and examine it for wear, overstress, and cyclical fatigue. Pay special attention to the end hooks of the spring. Replace the spring as necessary.

   e) Clean the inside of the stainless steel support arm housing using a stainless steel brush. Do not use a non-stainless wire brush.

   f) Examine the upper and lower bushings. Replace them if they are excessively worn or marred. Replace them if the support arm spar is not tracking correctly (i.e. there is too much twist).

   g) Re-assemble the support arm assembly in the reverse order of steps a-d. Use a simple hook made of stiff wire or similar tool to pull the spring into position when re-inserting the roll pin through the base of the support arm housing and the end hook of the spring.

   i) Check the operation of the ratchet knob and support arm assembly once again. Each support arm hook should engage and disengage with the ratchet slots in the housing, pull out smoothly, stop at the stop screw, easily slide back into the stored position, and properly self stow when it is released.

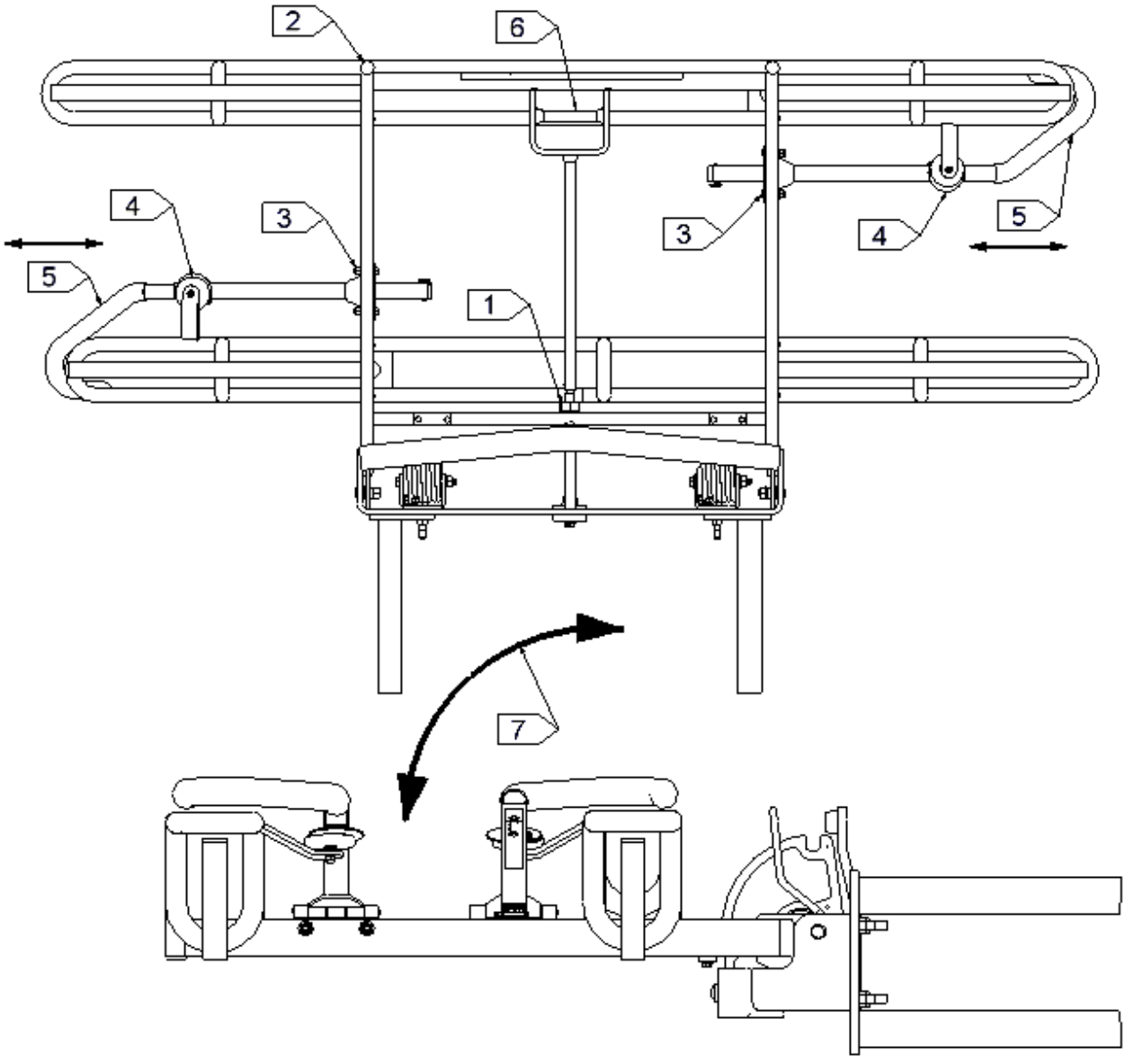
2) If the support arm spar is bent it should be replaced.

3) Examine the support arm assembly mounting pivot. Check the pivot for side play. Side play can be adjusted by tightening the 3/8-16 nylock nut. Do not over tighten. The pivot should be free with a small amount of play. With the support arm assembly vertical and fully retracted lightly push the grip towards the front of the bus and then away from the bus. If total movement exceeds 2”, replace the worn parts. DO NOT LUBRICATE.

DL2 BIKE RACK

FIG 1: DL2 VISUAL INSPECTION

Top View



Side View

BIKE RACK VISUAL INSPECTION

Sportworks recommends the following quick visual inspection to ensure an operable bike rack. Use this page as an inspection sheet for your transit operators.

Examine the 7 items below before operating your coach. If the bike rack does not function properly, service it before putting it into operation.

1) _____√HEX CAP IS TIGHT
Tighten by hand (preferably by tool) if required.

2) _____√ENDPLUGS ARE PRESENT (2 PLACES)
Replace plugs if missing or damaged.

3) _____√BOLTS ARE PRESENT—SECURE ARMS TO FRAME (4 PLACES)
Replace missing bolts.

4) _____√MAGNETS ARE PRESENT (2 PLACES)
Replace if missing. These magnets stow the hook arms.

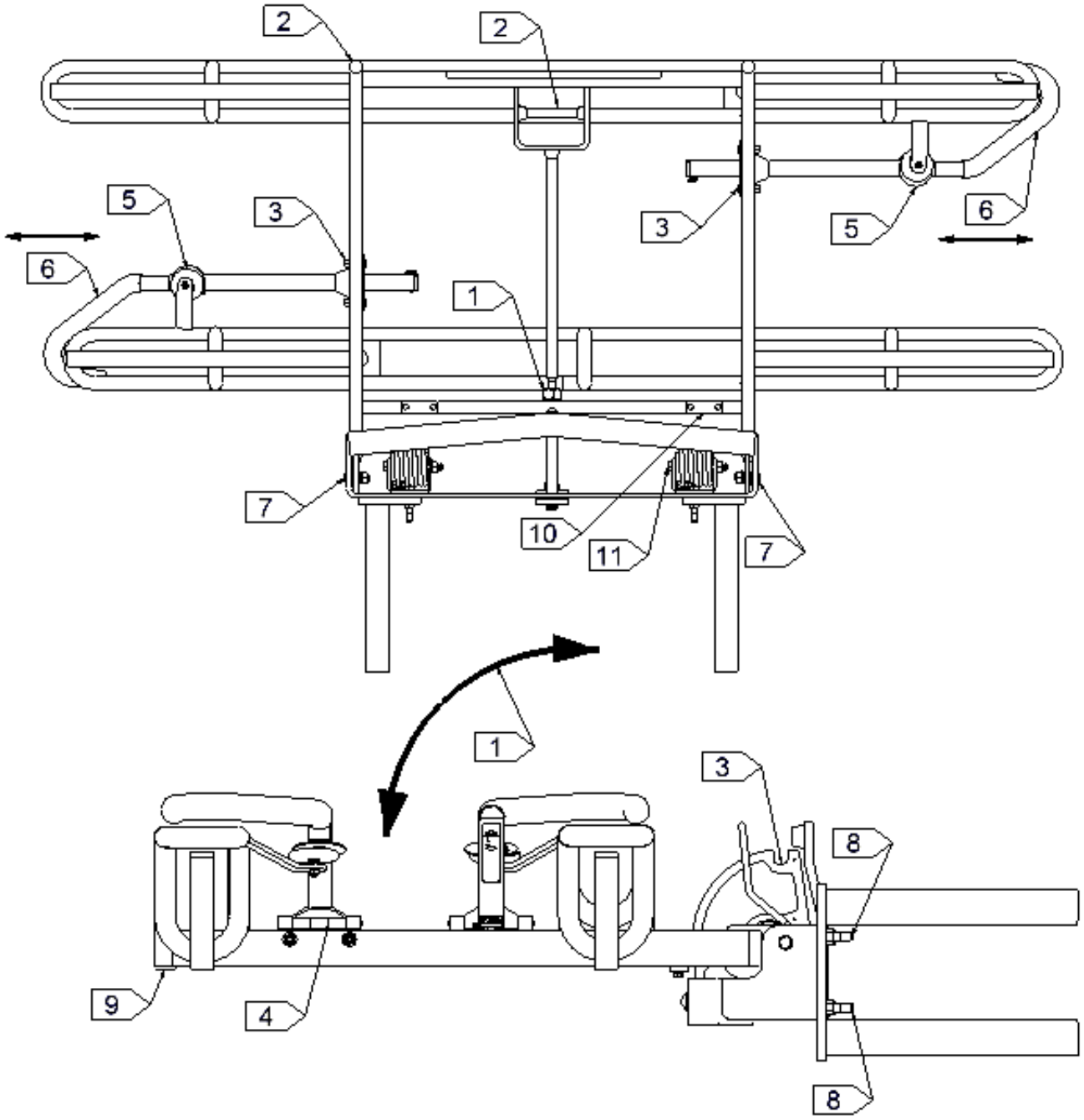
5) _____√HOOK ARMS SLIDE IN/ OUT (2 PLACES)
Hooks move smoothly in/out and self-stow on magnet.
DO NOT LUBRICATE.

6) _____√LATCH HANDLE WORKS
Latch is easy to release and does not get stuck.

7) _____√BIKE RACK SWINGS FREELY AND LOCKS IN TWO POSITIONS
Rack pivots and locks in both the deployed and stored positions.

FIG 2: DL2 MAINTENANCE

The DL2 and its accompanying brackets require very little service. Regular suggested maintenance checks are included below.



30 DAY GENERAL MAINTENANCE INSPECTION & SERVICE

Check every 30 days to insure that:

1. The rack swings freely and smoothly between the deployed and stored positions.

2. The release latch easily unlatches and does not stick in the release position.

3. The release latch automatically locks the rack in place when moved to the deployed or stored positions.

4. Each support arm hinge allows the support arm to raise and lower without undue constraint.

5. Each support arm magnet properly mates with and holds the support arm.

6. Each support arm hook pulls out smoothly, stops at the stop screw, easily slides back into the stored position, and properly self stows on the magnet when it is released.

7. Both pivot bolt assemblies are tight. If you see excessive wear or cracks in the bronze oilite bushings you must replace them immediately. Some cutaway vehicles tend to cause the bushings to wear more quickly. You can replace the originals with our heavy duty pivot bolt kit P/N 100839 for longer life.

8. All fasteners are tight on the mounting bracket, including the hardware for the support strap, quadrant, pivot plate to bracket pieces, and bracket pieces to bumper or coach body.

9. There are two black plastic end plugs inserted into the main frame of the rack located near the ends of the lowering tube (the tube one grabs to engage the release latch). Replace if missing.

10. Check Torsion Spring Wear Pad for excessive wear or loose attachment to frame.

11. Torsion Spring Pivot Bolts are tight.

12. The instruction labels on the rack are intact. Replace if shredded, partially removed, non-readable, or not adhering properly. Clean the rack surface thoroughly (isopropyl alcohol) before replacing. Pay particular attention to the chain guard sticker.

13. If surface rust develops on stainless steel use naval jelly to remove.

SERVICING

In addition to the 30 day general maintenance and service inspections, there are more specific service guidelines to follow in maintaining the Sportworks' bike rack. The guidelines are easy to follow and should be done so every 30 days. If there are problems with the bike rack or mounting bracket, replace or repair them to proper working order and return them to service. Contact Sportworks for parts.

SERVICING THE DL2 BIKE RACK

Service every 30 days

1) If the bike rack is not raising and lowering with ease, check the two pivot bolt assemblies for incorrect installation or wear. Replace the assemblies if damaged. Check that the pivot tabs are straight and aligned to properly pivot the bike rack. Straighten the tabs as required.

2) Check the pivot plate for correct alignment and damage. Remove and straighten the pivot plate if it is not straight.

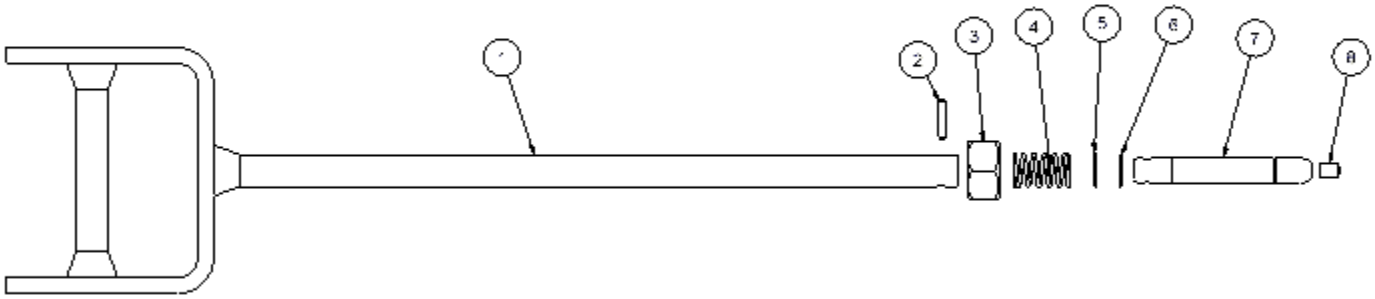
3) If the bike rack magnet does not properly mate with the support arm, check the alignment of the magnet arm (the steel strap securing the magnet to the bike rack). Tweak the magnet arm as required.

4) Make sure the fasteners holding the magnet assemblies to the magnet arm are tight. Examine the magnet and magnet housing for wear. Replace if damaged.

5) Examine the structural integrity of the main loops, saddle pieces, and the rectangular tubing of the main frame. Repair or replace the bike rack if damaged.

FIG 3: SERVICING THE DL2 LATCH MECHANISM

Service every 6 months



Item #	PART #	NAME	DESCRIPTION
1	100180	Latch Handle	DL2 Latch Handle with Roll Pin
2		Roll Pin	
3	100179	Hex Cap	DL2 Latch Pin Assy
4		Spring	
5		Rotor Clip	
6		Washer	
7		Latch Pin	
8		Rivet	

1) Check that the release handle and handle stem are straight. Straighten them if they are bent out of line.

2) Examine the wear of the plastic insert in the tip of the latch pin. Replace the insert if the latch quadrant is being marred by the latch pin.

3) If the latch pin does not properly track on the latch quadrant, check that the quadrant is attached tightly and squarely to the pivot plate. Replace the quadrant if damaged.

4) Examine the components inside of the latch housing.

   a) Remove the roll pin attaching the latch stem to the latch pin.

   b) After removing the roll pin, pull on the release handle to separate the latch stem from the latch pin.

c) Unscrew the latch capnut and remove the components from inside the latch housing.

d) Check the wear on the spring. Clean the spring and replace it if it is distorted or not functioning properly.

e) Check the snap ring on the latch pin. Replace the snap ring if it is cracked, broken, or warped.

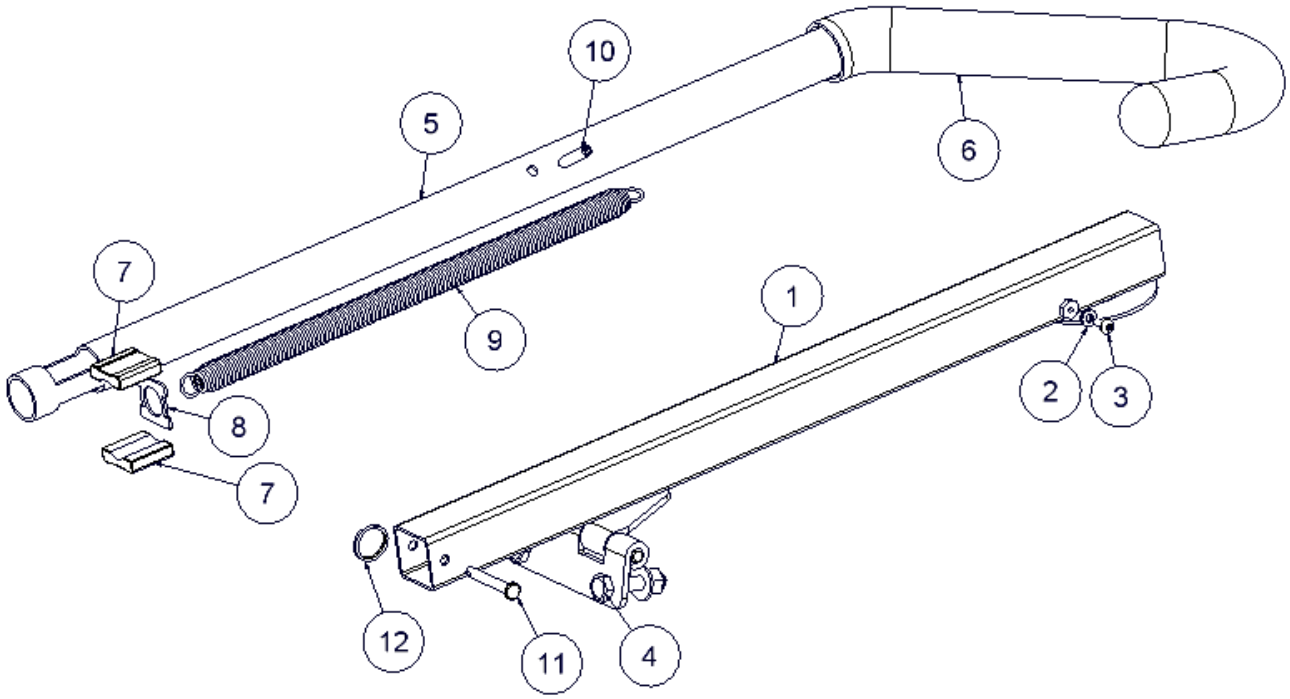
f) Remove any dirt and debris from inside the latch housing.

g) Re-assemble the latch mechanism in the reverse order of steps a-c.

DO NOT LUBRICATE.

FIG 4: SERVICING THE SUPPORT ARM

Service every 6 months



Parts & Service Fig. 5

ITEM	PART #	NAME	DESCRIPTION
1	100594	Arm Housing Weldment	Support Arm Housing, SS NP, DL2 and Middle Position Trilogy
2		Washer, Nylon	
3		PHCS, 6-32 x 5/16, S/S	
4		¼-20 SS Screw, Washer & Nut	
5	100112	Standard Support Arm Hook – Stainless	Support Arm Hook
6		Grip, Molded	
7		Acetal Slider Piece	
8		Stop Plate	
9	100110	Spring	Support Arm Spring Kit
10		Pin, Roll 3/16 x 1 , S/S	
11		Pin, Clevis, 3/16 x 1 1/4, S/S	
12		Ring, Split, S/S	

1) Examine the components inside of the support arm.

   a) Remove the bolts attaching the support arm hinge to the bike rack.

   b) Remove the stop screw at the top (washer end) of the support arm housing. Remove the roll pin from the base of the support arm housing.

   c) Carefully slide the stainless steel hook arm out from the support arm housing. Make note of how the two nylon slider keys and stop plate fit at the base of the hook arm.

   d) Remove the roll pin on the hook arm to free the support arm spring. Clean the spring and examine it for wear, overstress, and cyclical fatigue. Pay special attention to the end hooks of the spring. Replace the spring as necessary.

   e) Clean the inside of the stainless steel support arm housing using a stainless steel brush. Do not use a non-stainless wire brush.

   f) Examine the two nylon slider keys that rest at the base of the hook arm. Replace them if they are excessively worn or marred. Replace them if the support tube is not tracking correctly (i.e. there is too much twist).

   g) Examine the stop plate that rests at the base of the hook arm. Replace it if excessively worn, marred, cracked, or has any broken corners.

   h) Re-assemble the support arm in the reverse order of steps a-d. Use a simple hook made of stiff wire or similar tool to pull the spring into position when re-inserting the roll pin through the base of the support arm housing and the end hook of the spring.

   i) Check the operation of the support arm once again. Each support arm hook should pull out smoothly, stop at the stop screw, easily slide back into the stored position, and properly self stow on the magnet when it is released.

2) Straighten the support arm hook if it is bent, especially the portion of the hook that rests inside of the support arm housing--the hook may “freeze” up until it is straightened properly. DO NOT LUBRICATE.

3) Examine the support arm hinge. Check the hinge for side play and warpage. With the support arm vertical and the hook fully retracted lightly push the hook towards the front of the bus and then away from the bus. If total movement exceeds 2”, replace the support arm housing.

4) Examine the grip on the hook of the hook arm. Replace it if ripped, gouged, or worn thin.

INSTALLATION INSTRUCTIONS FOR SUPPORT ARM GRIPS

1) Secure Hook / Support Arm Assembly.

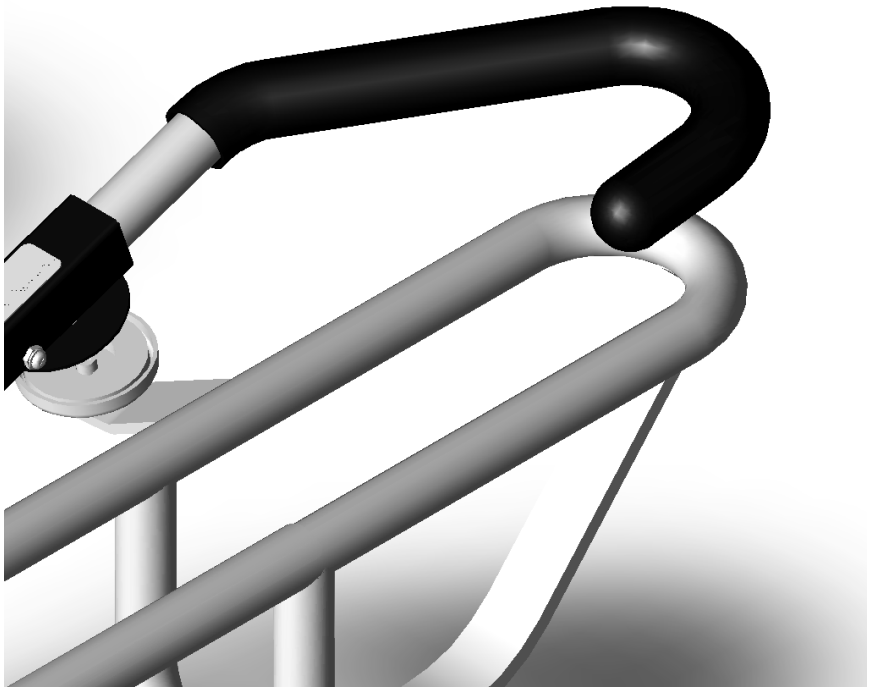
2) Use a 20-30% Palmolive™/ Water or equivalent dish soap solution.

3) Apply solution to hook tube and to inside of foam grip.

4) Slide grip onto hook; it will be necessary to twist and work grip past bend in short, incremental movements.

5) Slide grip until it bottoms out on end of hook tube, being careful not to compromise the end of the grip by stretching it too tightly.

6) Allow 1 hour for solution to evaporate and grip to tighten. Always test the grip before putting into service to ensure proper adhesion.



SERVICE OF BIKE RACK

In addition to the 30 day general maintenance and service inspections, there are more specific service guidelines to follow in maintaining the Sportworks' bike rack. The guidelines are easy to follow and should be done so every 30 days. If there are problems with the bike rack or mounting bracket, replace or repair them to proper working order and return them to service. Contact Sportworks for parts.

SERVICING THE 3 Position Recessed Style BIKE RACK

Service every 30 days

1) If the bike rack is not raising and lowering with ease, check the two pivot bolt assemblies for incorrect installation or wear. Replace the assemblies if damaged. Check that the pivot tabs are straight and aligned to properly pivot the bike rack. Straighten the tabs as required.

2) Check the pivot plate for correct alignment and damage. Remove and straighten the pivot plate if it is not straight.

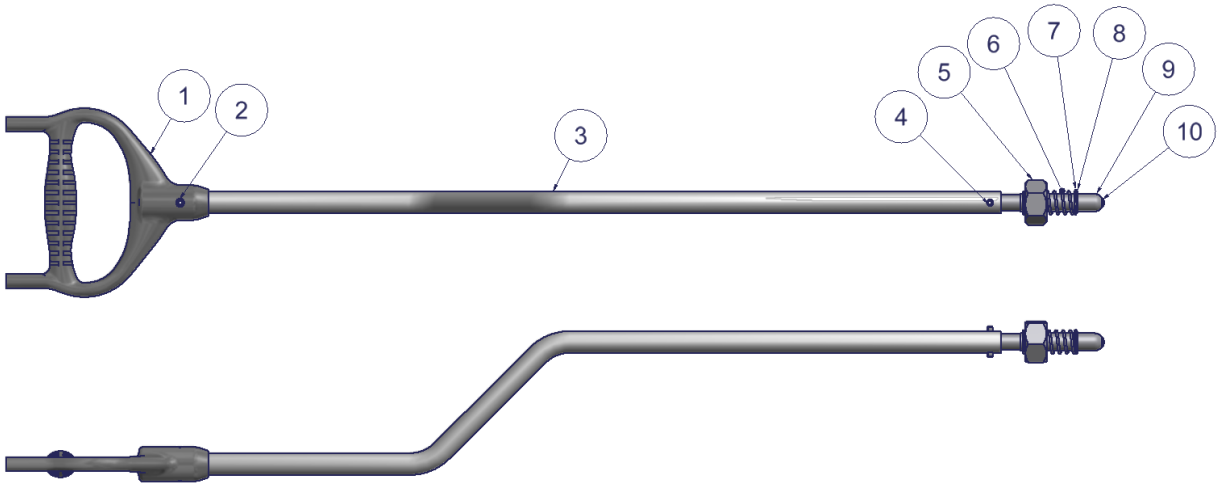
3) If the bike rack magnet does not properly mate with the support arm, check the alignment of the magnet arm (the steel strap securing the magnet to the bike rack). Tweak the magnet arm as required.

4) Make sure the fasteners holding the magnet assemblies to the magnet arm are tight. Examine the magnet and magnet housing for wear. Replace if damaged.

5) Examine the structural integrity of the main loops, saddle pieces, and the rectangular tubing of the main frame. Repair or replace the bike rack if damaged.

FIG 3: SERVICING THE LATCH MECHANISM

Service every 6 months



Item #	Component	Spares Part #	DESCRIPTION
1	Handle	101147	SPARES - Recessed Bumper, Short, Latch Handle Sub Assy
2	Roll Pin		
3	Tube		
4	Roll Pin		
5	Cap	100186	SPARES - DL2 Latch Housing Cap
6	Spring	100190	SPARES - DL2 Latch Spring--1ea
7	Washer	100179	SPARES - MMT Latch Pin Assy (Includes Cap)
8	Circlip		
9	Latch Pin		
10	Button		

1) Check that the release handle and handle stem are straight. Straighten them if they are bent out of line.

2) Examine the wear of the plastic insert in the tip of the latch pin. Replace the insert if the latch quadrant is being marred by the latch pin.

3) If the latch pin does not properly track on the latch quadrant, check that the quadrant is attached tightly and squarely to the pivot plate. Replace the quadrant if damaged.

4) Examine the components inside of the latch housing.

a) Remove the roll pin attaching the latch stem to the latch pin.

b) After removing the roll pin, pull on the release handle to separate the latch stem from the latch pin.

c) Unscrew the latch capnut and remove the components from inside the latch housing.

d) Check the wear on the spring. Clean the spring and replace it if it is distorted or not functioning properly.

e) Check the snap ring on the latch pin. Replace the snap ring if it is cracked, broken, or warped.

f) Remove any dirt and debris from inside the latch housing.

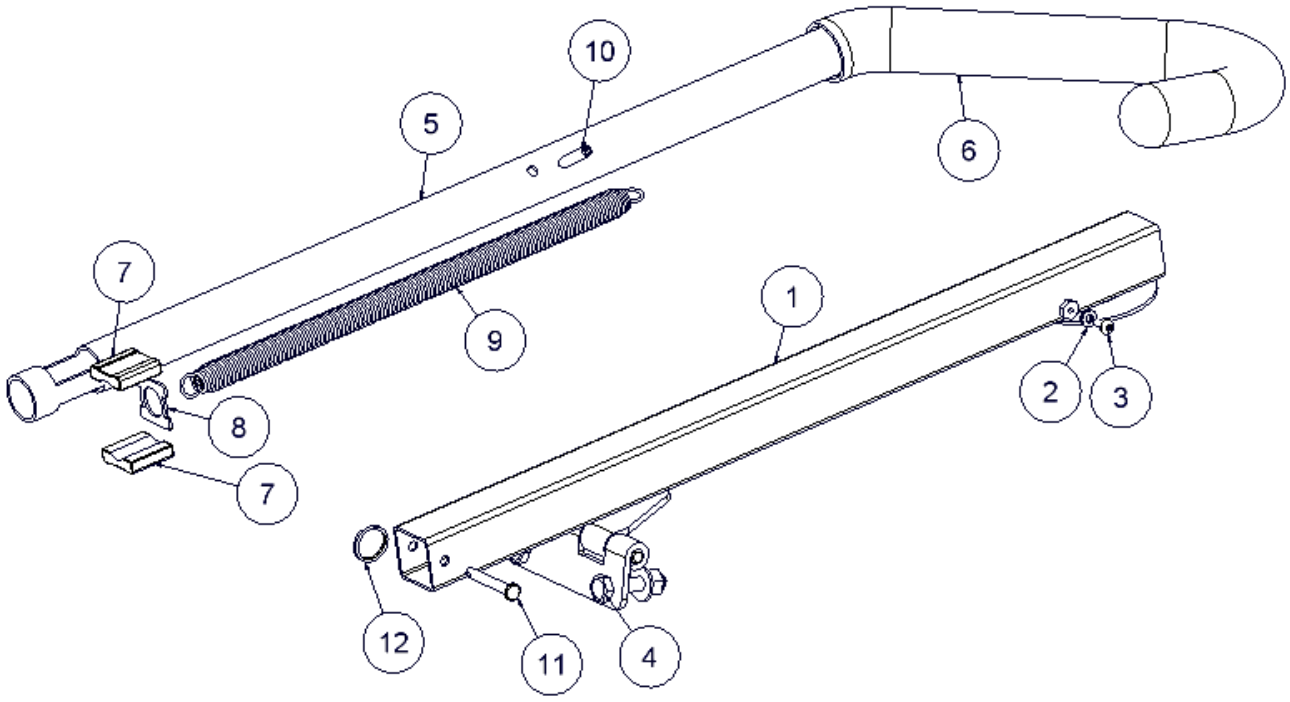
g) Re-assemble the latch mechanism in the reverse order of steps a-c.

DO NOT LUBRICATE.

FIG 4: SERVICING THE SUPPORT ARM

The Recessed Style Trilogy uses three different Support Arms. The three Arms use different Hooks and Housings but the internal components are the same.
100588-SPAN, SPARES - Support Arm Assembly DL2, DL3 Middle Pos, SS Anti Glare, Bilingual Decals
100589-SPAN, SPARES - Support Arm Assembly - Outside Position, Trilogy, ENGLISH SPANISH DECALS
100587-SPAN, SPARES - Support Arm Assembly - Inside Position, ENGLISH SPANISH DECALS

Service every 6 months



1) Examine the components inside of the support arm.

   a) Remove the bolts attaching the support arm hinge to the bike rack.

   b) Remove the stop screw at the top (washer end) of the support arm housing. Remove the roll pin from the base of the support arm housing.

   c) Carefully slide the stainless steel hook arm out from the support arm housing. Make note of how the two nylon slider keys and stop plate fit at the base of the hook arm.

d) Remove the roll pin on the hook arm to free the support arm spring. Clean the spring and examine it for wear, overstress, and cyclical fatigue. Pay special attention to the end hooks of the spring. Replace the spring as necessary.

e) Clean the inside of the stainless steel support arm housing using a stainless steel brush. Do not use a non-stainless wire brush.

f) Examine the two nylon slider keys that rest at the base of the hook arm. Replace them if they are excessively worn or marred. Replace them if the support tube is not tracking correctly (i.e. there is too much twist).

g) Examine the stop plate that rests at the base of the hook arm. Replace it if excessively worn, marred, cracked, or has any broken corners.

h) Re-assemble the support arm in the reverse order of steps a-d. Use a simple hook made of stiff wire or similar tool to pull the spring into position when re-inserting the roll pin through the base of the support arm housing and the end hook of the spring.

i) Check the operation of the support arm once again. Each support arm hook should pull out smoothly, stop at the stop screw, easily slide back into the stored position, and properly self stow on the magnet when it is released.

2) Straighten the support arm hook if it is bent, especially the portion of the hook that rests inside of the support arm housing--the hook may “freeze” up until it is straightened properly. DO NOT LUBRICATE.

3) Examine the support arm hinge. Check the hinge for side play and warpage. With the support arm vertical and the hook fully retracted lightly push the hook towards the front of the bus and then away from the bus. If total movement exceeds 2”, replace the support arm housing.

4) Examine the grip on the hook of the hook arm. Replace it if ripped, gouged, or worn thin.

INSTALLATION INSTRUCTIONS FOR SUPPORT ARM GRIPS

1) Secure Hook / Support Arm Assembly.

2) Use a 20-30% Palmolive™/ Water or equivalent dish soap solution.

3) Apply solution to hook tube and to inside of foam grip.

4) Slide grip onto hook; it will be necessary to twist and work grip past bend in short, incremental movements.

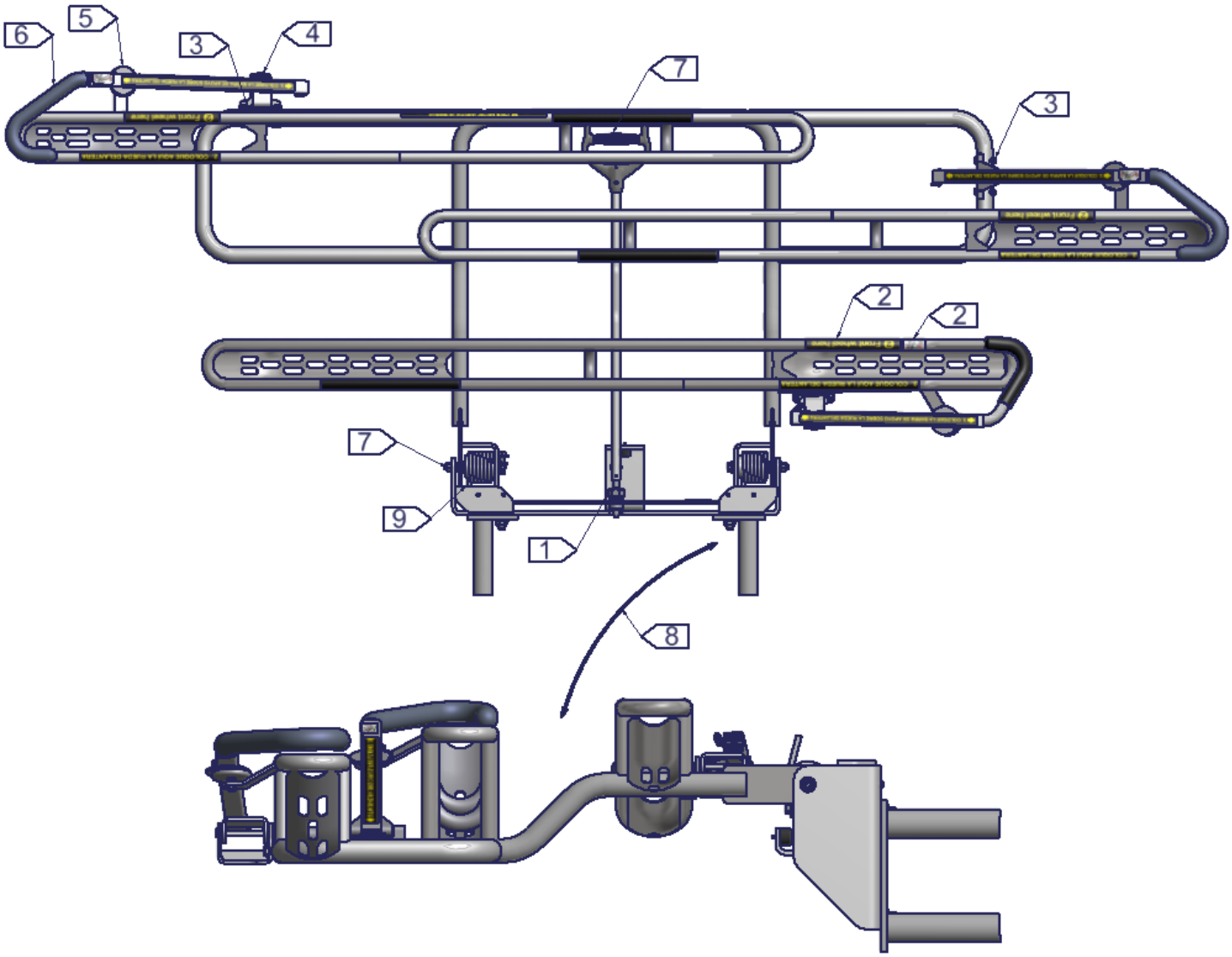
5) Slide grip until it bottoms out on end of hook tube, being careful not to compromise the end of the grip by stretching it too tightly.

6) Allow 1 hour for solution to evaporate and grip to tighten. Always test the grip before putting into service to ensure proper adhesion.

3 POSITION RECESSED STYLE BIKE RACK

FIG 1: VISUAL INSPECTION

Top View, Side View



BIKE RACK VISUAL INSPECTION

Sportworks recommends the following quick visual inspection to ensure an operable bike rack. Use this page as an inspection sheet for your transit operators. Examine the 8 items below before operating your coach. If the bike rack does not function properly, service it before putting it into operation.

1) _____√HEX CAP IS TIGHT
Tighten by hand (preferably by tool) if required.

2) _____√INTRUCTION DECALS ARE LEGIBLE (3 PLACES)
Replace plugs if missing or damaged.

3) _____√BOLTS ARE PRESENT—SECURE ARMS TO FRAME (3 PLACES)
Replace missing bolts

4) _____√CLEVIS PINS ARE SECURE WITH SPLIT RING—SECURE ARMS TO BRACKETS (2 PLACES) Replace missing or damaged clevis pins and split rings

5) _____√MAGNETS ARE PRESENT (2 PLACES)
Replace if missing. These magnets stow the hook arms.

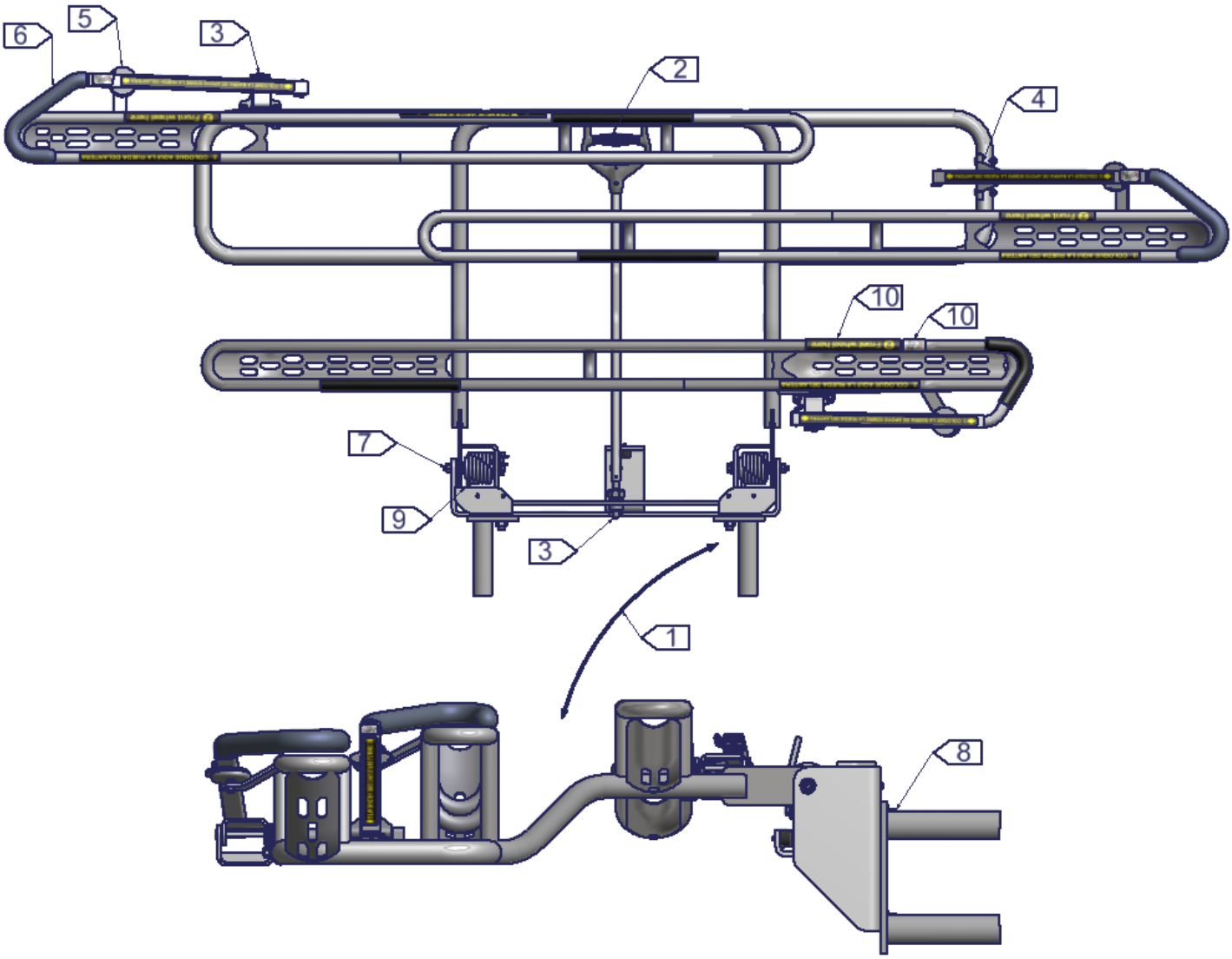
6) _____√HOOK ARMS SLIDE IN/ OUT (2 PLACES)
Hooks move smoothly in/out and self-stow on magnet.
DO NOT LUBRICATE.

7) _____√LATCH HANDLE WORKS
Latch is easy to release and does not get stuck.

8) _____√BIKE RACK SWINGS FREELY AND LOCKS IN TWO POSITIONS
Rack pivots and locks in both the deployed and stored positions.

FIG 2: MAINTENANCE

The 3 Position Recessed Style Bike Rack and its accompanying brackets require very little service. Regular suggested maintenance checks are included below.



30 DAY GENERAL MAINTENANCE INSPECTION & SERVICE

Check every 30 days to insure that:

1. The rack swings freely and smoothly between the deployed and stored positions.

2. The release latch easily unlatches and does not stick in the release position.

3. The release latch automatically locks the rack in place when moved to the deployed or stored positions.

4. Each support arm hinge allows the support arm to raise and lower without undue constraint.

5. Each support arm magnet properly mates with and holds the support arm.

6. Each support arm hook pulls out smoothly, stops at the stop screw, easily slides back into the stored position, and properly self stows on the magnet when it is released.

7. Both pivot bolt assemblies are tight. If you see excessive wear or cracks in the bronze oilite bushings you must replace them immediately. Some cutaway vehicles tend to cause the bushings to wear more quickly. You can replace the originals with our heavy duty pivot bolt kit P/N 100839 for longer life.

8. All fasteners are tight on the mounting bracket, including the hardware for the support strap, quadrant, pivot plate to bracket pieces, and bracket pieces to bumper or coach body.

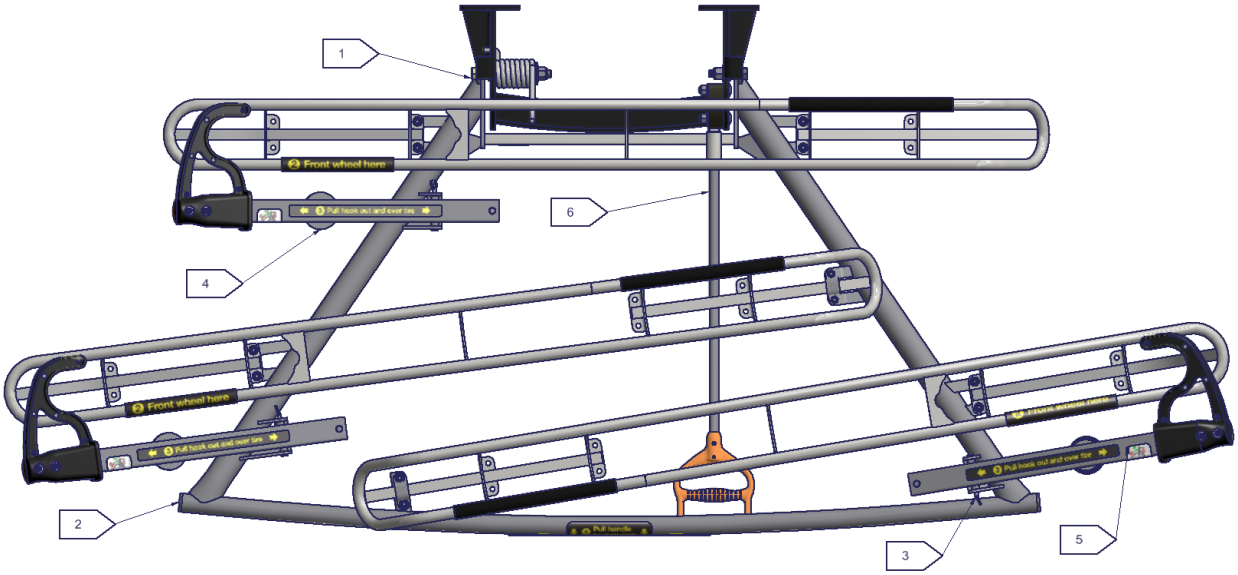
9. Torsion Springs do not interfere with rack deployment.

10. The instruction labels on the rack are intact. Replace if shredded, partially removed, non-readable, or not adhering properly. Clean the rack surface thoroughly (isopropyl alcohol) before replacing. Pay particular attention to the chain guard sticker.

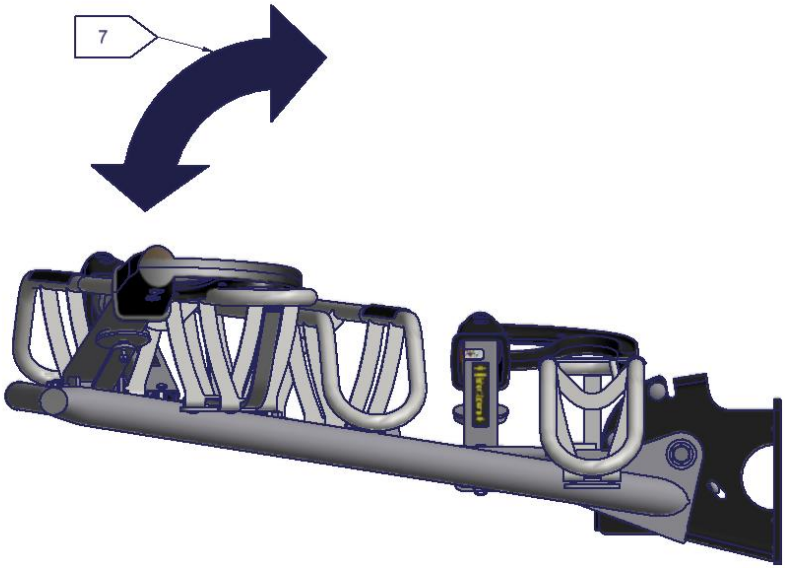
11. If surface rust develops on stainless steel use naval jelly to remove.

APEX3 BIKE RACK

VISUAL INSPECTION



Top View



Side View

BIKE RACK VISUAL INSPECTION

Sportworks recommends the following quick visual inspection to ensure an operable bike rack. Use this page as an inspection sheet for your transit operators.

Examine the 7 items below before operating your coach. If the bike rack does not function properly, service it before putting it into operation.

1)_____√PIVOT BOLTS ARE TIGHT
Tighten if required.

2)_____√ENDPLUGS ARE PRESENT (2 PLACES)
Replace plugs if missing or damaged.

3)_____√CLEVIS PINS AND SPLIT RINGS ARE PRESENT—SECURE ARMS TO FRAME (3 PLACES)
Replace missing parts.

4)_____√MAGNETS ARE PRESENT (3 PLACES)
Replace if missing. These magnets stow the support arms.

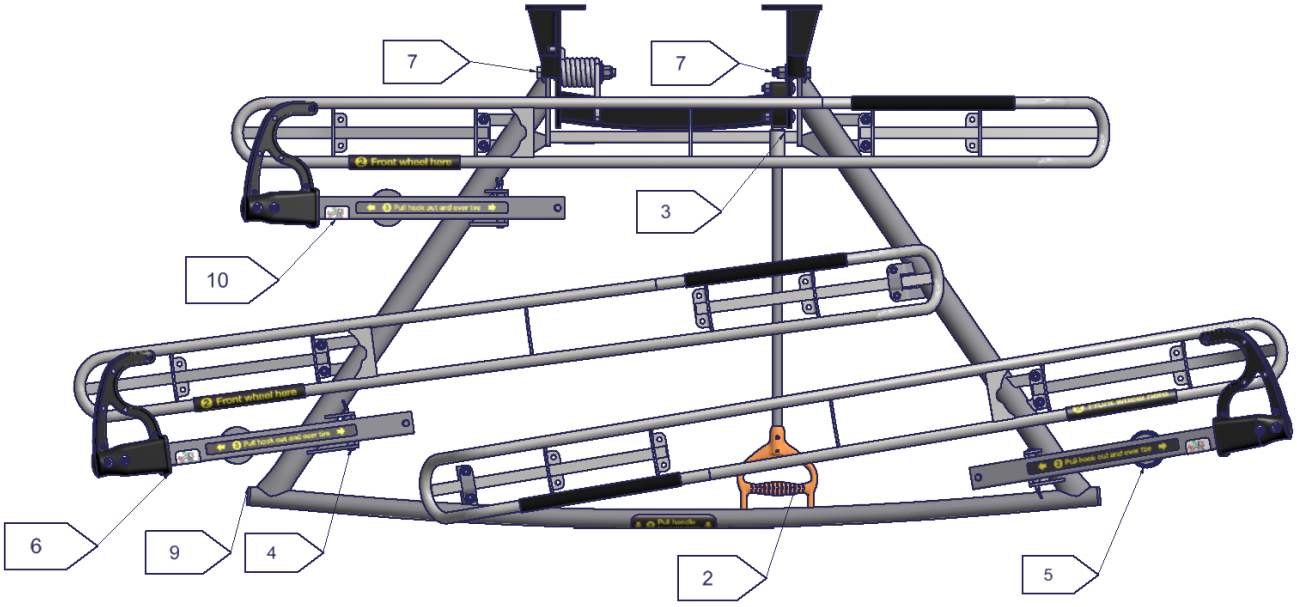
5)_____√SUPPORT ARMS SLIDE IN/ OUT (3 PLACES)
Hooks move smoothly in/out and self-stow on magnet.
DO NOT LUBRICATE.

6)_____√LATCH HANDLE WORKS
Latch is easy to release and does not get stuck.

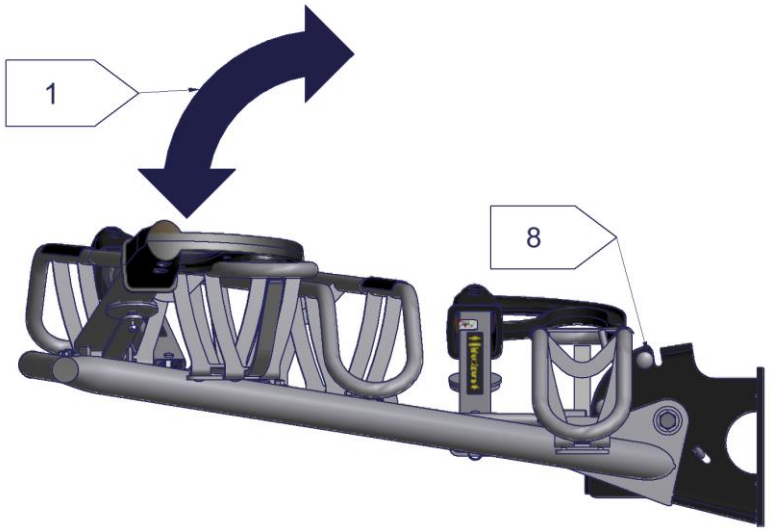
7)_____√BIKE RACK SWINGS FREELY AND LOCKS IN TWO POSITIONS
Rack pivots and locks in both the deployed and stored positions.

APEX3 MAINTENANCE

The Apex3 and its accompanying brackets require very little service. Regular suggested maintenance checks are included below.



Top View



Side View

30 DAY GENERAL MAINTENANCE INSPECTION & SERVICE

Check every 30 days to insure that:

1. The rack swings freely and smoothly between the deployed and stored positions.

2. The release latch easily unlatches and does not stick in the release position.

3. The release latch automatically locks the rack in place when moved to the deployed or stored positions.

4. Each support arm hinge allows the support arm to raise and lower without undue constraint.

5. Each support arm magnet properly mates with and holds the support arm.

6. Each support arm hook pulls out smoothly, easily slides back into the stored position, and properly self stows on the magnet when it is released.

7. Both pivot bolt assemblies are tight. If you see excessive wear or cracks in the bronze oilite bushings you must replace them immediately.

8. All fasteners are tight on the mounting bracket, including hardware for the quadrant, pivot plate to bracket pieces, and bracket pieces to bumper or coach body.

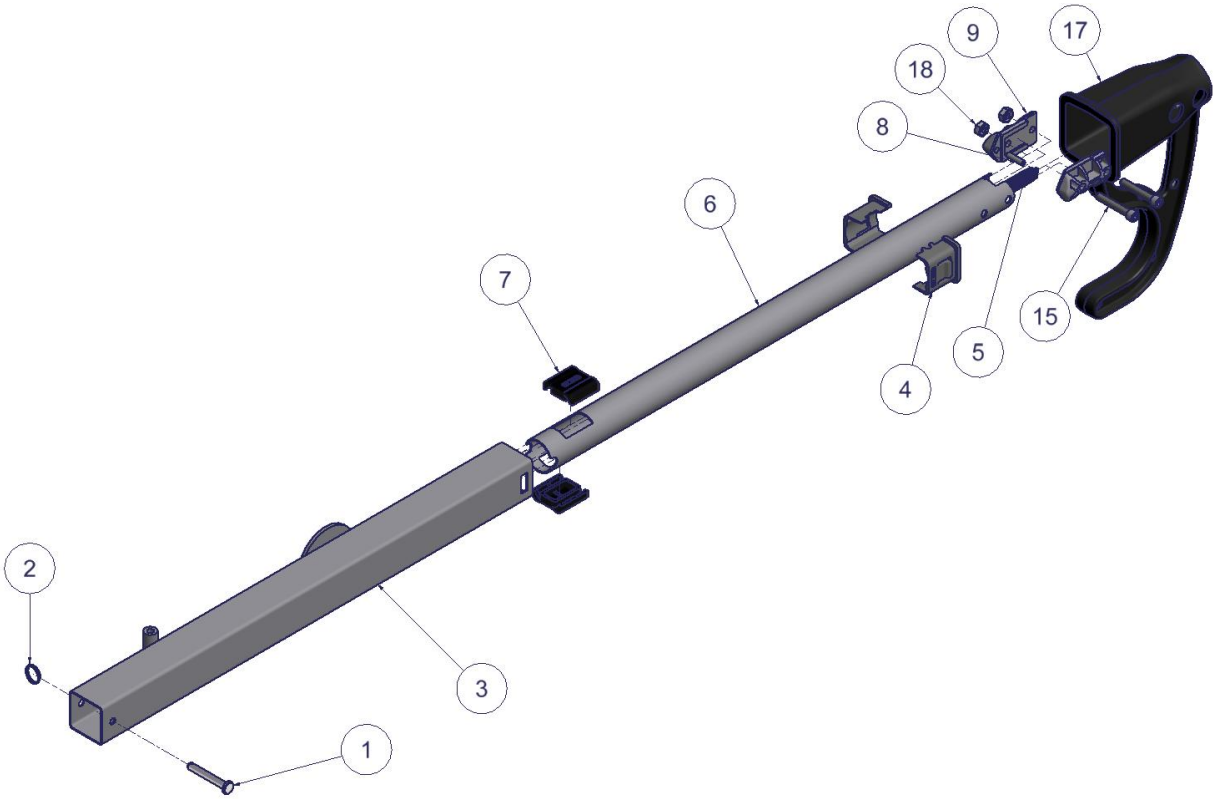
9. There are two black plastic end plugs inserted into the main frame of the rack located at either end of the lowering tube (the tube one grabs to engage the release latch). Replace if missing.

11. The instruction labels on the rack are intact. Replace if shredded, partially removed, non-readable, or not adhering properly. Clean the rack surface thoroughly (isopropyl alcohol) before replacing. Pay particular attention to the chain guard sticker.

12. If surface rust develops on stainless steel use naval jelly to remove.

Servicing the Apex Support Arm

Service every 30 days



ITEM	QTY	PART	TITLE
1	1	3810	Pin, Clevis, 1/4 x 1.75, SS
2	1	7302	RING, SPLIT, .670 O.D. X .051 WIRE DIA, SS
3	1	3811-PEN	Weldment, Apex Support Arm Housing, Shot Peened
4	2	3608	CS Upper Bushing
5	1	9662	SUPPORT ARM SPRING
6	1	4492	Support Arm Spar, Apex
7	2	3609	Apex Lower Bushing
8	1	4557	PIN, ROLL 5/32 X .75,SS
9	2	4493	Shank Support, Apex Support Arm Hook
15	2	4571	SHCS, .250-20 X 1.75
17	1	4494	Support Arm Grip, Apex
18	2	9893	NUT; 1/4-20 DEFORMED THREAD SELF LOCKING; SST

****NOTE: PLEASE ASK SALES FOR 6 DIGIT FINISHED GOODS P/N**

1) Examine the components inside of the support arm.

   a) Remove the split ring from the clevis pin in the support arm pivot.

   b) Remove the split ring (2) from the clevis pin (1) at the bottom of the support arm housing. Remove the clevis pin.

   c) Remove the fasteners (15) from the support arm grip and remove the grip from the top of the spar. Carefully slide the stainless steel spar out the bottom of the support arm housing. Make note of how the two sets of nylon bushings (4) and (7) fit in the assembly.

   d) Pull the shank support (9) out the top of the spar to free the support arm spring. Clean the spring and examine it for wear, overstress, and cyclical fatigue. Pay special attention to the end hooks of the spring. Replace the spring as necessary.

   e) Clean the inside of the stainless steel support arm housing (3) using a stainless steel brush. Do not use a non-stainless wire brush.

   f) Examine the two nylon bushings (7) that are inserted in the base of the spar. Replace them if they are excessively worn or marred.

   g) Re-assemble the support arm in the reverse order of steps a-d. Use needle nose vise-grips similar tool to pull the spring into position when re-inserting the clevis pin (1) through the base of the support arm housing and the end hook of the spring.

   h) Check the operation of the support arm once again. Each support arm hook should pull out smoothly, easily slide back into the stored position, and properly self stow on the magnet when it is released.

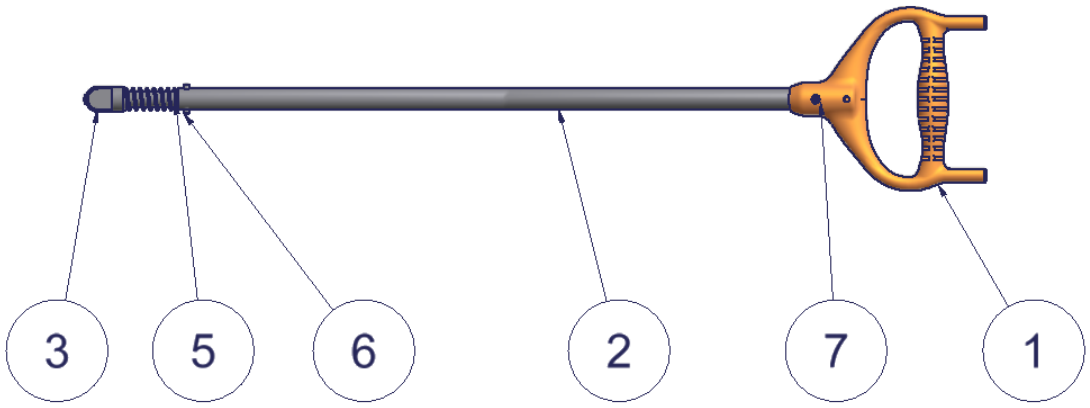
2) Replace the spar tube if it is bent. The arm may bind if bent. DO NOT LUBRICATE.

3) Examine the support arm pivot. Check clevis pin for wear. Replace if damaged or worn.

4) Examine the rubber grip. Replace it if ripped, gouged, or bent.

SERVICING THE APEX3 LATCH MECHANISM

Service every 30 days



ITEM	PART NUMBER	QTY	DESCRIPTION
1	9661	1	VeloPorter Handle, Latch Bar, Plastic
2	4487	1	DL2 LATCH HANDLE TUBE
3	3603	1	CS Latch Pin
4	7098	1	LATCH PIN RIVET
5	7068	1	SPRING, Compression, for DL2 Latch, Stainless
6	3584	1	PIN, ROLL 5/32 X .75,SS
7	7014	1	PIN, ROLL 3/16 X 1 SS

1) Check that the release handle operates smoothly.

2) Examine the wear of the plastic insert in the tip of the latch pin. Replace the insert if the latch quadrant is being marred by the latch pin.

3) Examine the components inside of the latch housing.

   a) Remove the roll pin attaching the latch stem to the latch pin.

   b) After removing the roll pin, pull on the release handle to separate the latch stem from the latch pin.

   c) Check the wear on the spring. Clean the spring and replace it if it is distorted or not functioning properly.

   d) Remove any dirt and debris from inside the latch housing.

   e) Re-assemble the latch mechanism in the reverse order of steps a-c.

DO NOT LUBRICATE. **NOTE: PLEASE ASK SALES FOR 6 DIGIT FINISHED GOODS P/N

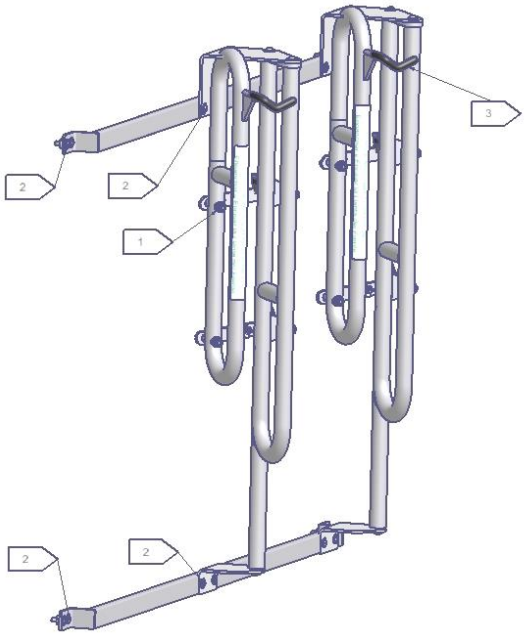
INTERLOCK INTERIOR BIKE RACK

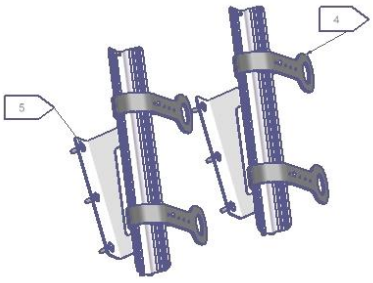
INTERLOCK BIKE RACK VISUAL INSPECTION

Sportworks recommends the following quick visual inspection to ensure an operable interior bike rack. Use this page as an inspection sheet for your transit operators.

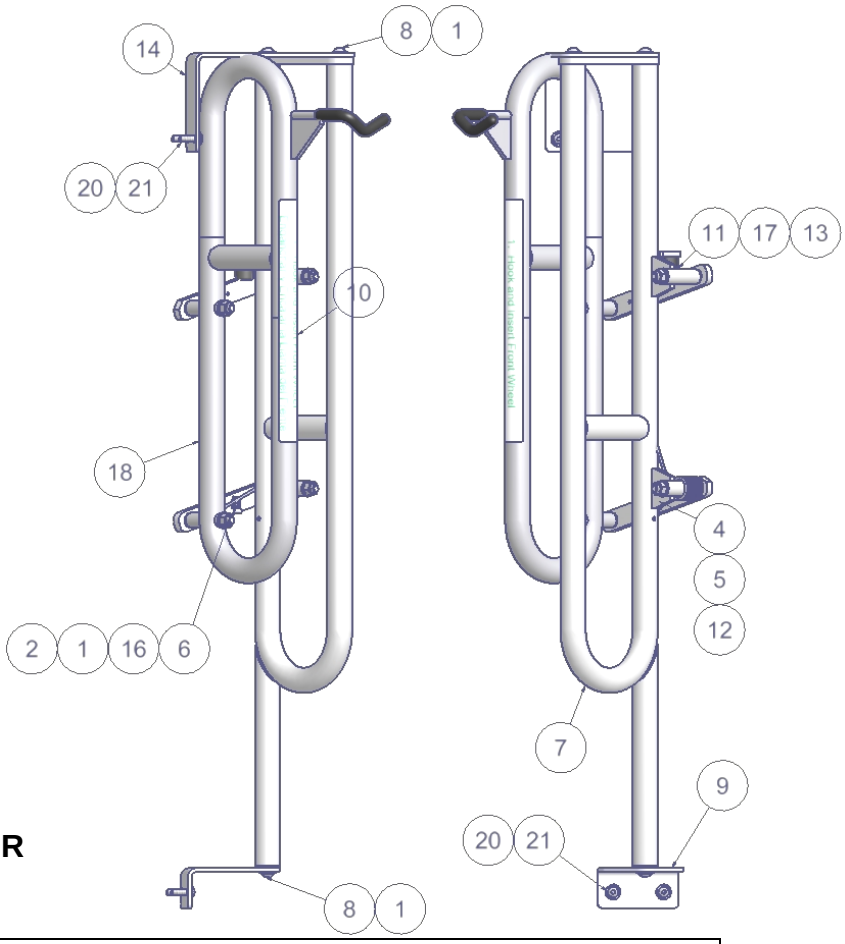
Examine the items below before operating your coach. If the Interlock bike rack does not function properly, service it before putting it into operation.

1) _____√ SCISSOR NUTS ARE IN PLACE- Verify that lock nuts are in place and adjusted properly. Front Wheel Assembly should move up and down freely. Replace or adjust nuts if needed.
2) _____√ MOUNTING FASTENERS ARE SECURE- Verify that Upper Assembly socket head cap screws are secure. Replace or tighten if needed.
3) _____√ HOOK GRIP - Verify that grip is in place and not damaged. Replace if needed.
4) _____√ REAR WHEEL STRAP - Verify that strap is in place and not damaged. Replace if needed.
5) _____√ MOUNTING FASTENERS ARE SECURE- Verify that Lower Assembly socket head cap screws are secure. Replace or tighten if needed.





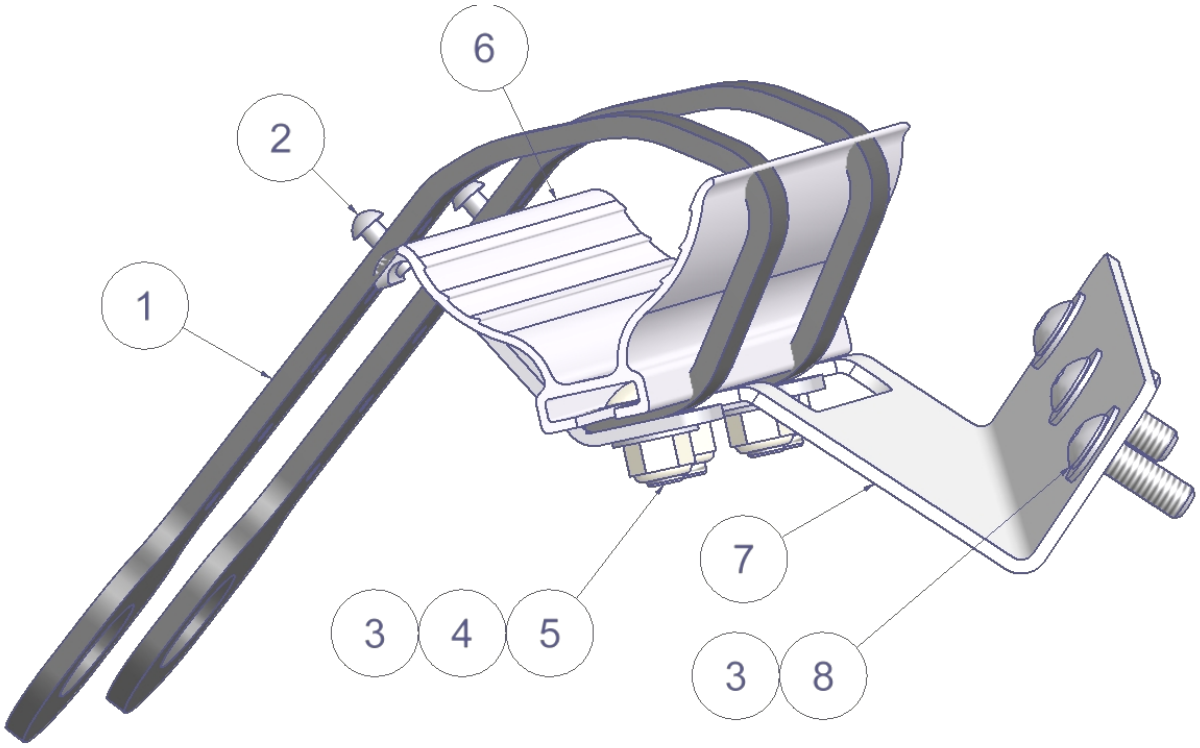
INTERLOCK SPARE PARTS
(UPPER ASSEMBLY)



****NOTE: PLEASE ASK SALES FOR 6 DIGIT FINISHED GOODS P/N**

ITEM #	QTY	P/N	DESCRIPTION
1	7	7013	WASHER, FLAT, 3/8 SS
2	4	9306	Washer, UHMW, .375 x .75 x .062 Thick
3	2	9304-PEN	Interior Rack Pinch Arm, Beadblast
4	1	9321	BHCS, 18-8 SS, 10-32 Thread, 3/8" Length
5	1	7159	WASHER, SAE #10, S/S
6	4	9534	Stud, Locking, 3/8-16 x 3.312
7	1	3924-PEN	Static Frame, LH 40 Deg, Bead Blast
8	3	7195	BHCS, 3/8-16x1, S/S, domestic
9	1	3926-PEN	Interior Rack Bracket Bottom,NF Reno, Beadblast
10	1	3922	LABEL, #1, Clear/Green, English Spanish
11	1	7452	Bumper, Rubber, 1 dia. w/ washer
12	1	3237	Brass One-Hole Strap for 3/16" Tubing, 1/32" Thick
13	1	9473	18-8 SS Button Head Socket Cap Screw 10-32 Thread
14	1	3923-PEN	Interior Rack Quadrant, RH 40 Deg, Top, Bead Blast
15	1	9325	Grip, .375 I.D. x 4 Long Vinyl
16	4	3430	18-8 Stainless Steel Toplock Locknut Hex, 3/8"-16
17	1	3893	Spacer, 1.0 OD x 0.5 Long
18	1	9291-PEN	Interior Rack Scissor, Beadblast
19	1	3236	Torsion Spring, Modified 9307
20	4	7819	Washer, 5/16 SS
21	4	7892	BHCS 5/16-18 x 1.0

INTERLOCK SPARE PARTS
(LOWER ASSEMBLY)

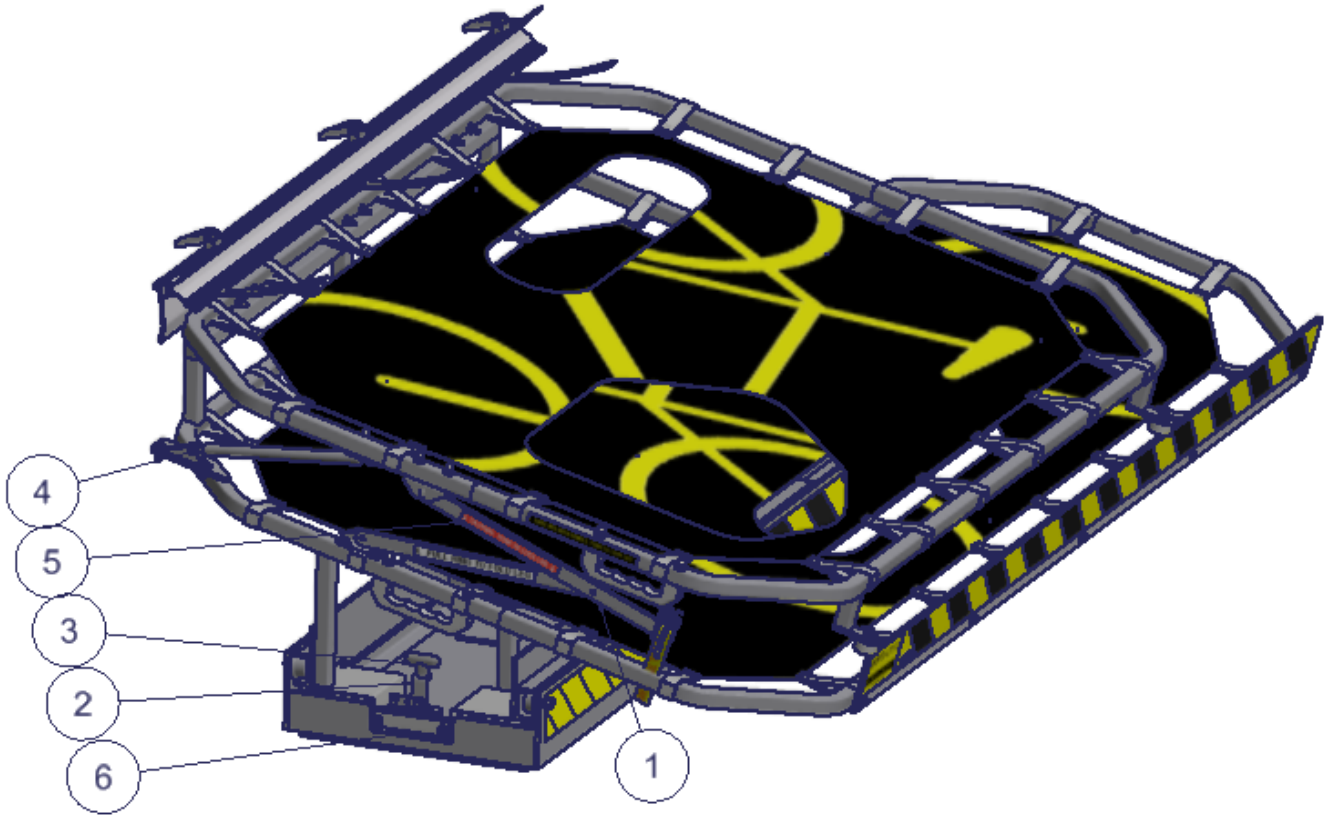


ITEM #	QTY	P/N	DESCRIPTION
1	2	9700	Interlock Rear Wheel Strap
2	2	9701	Interlock Rear Wheel Strap Anchor Weldment
3	7	7819	Washer, 5/16 SS
4	4	7884	Nut, Nylock, 5/16-18 SS
5	4	3109	BOLT, Carriage, 5/16-18 x 1, Stainless Steel
6	1	9697-SIL	Interlock Rear Wheel Tray, Silver Metallic
7	1	3872	Interlock Bracket , Rear Wheel Tray, NF Reno
8	3	7892	BHCS 5/16-18 x 1.0

****NOTE: PLEASE ASK SALES FOR 6 DIGIT FINISHED GOODS P/N**

MCI LUGGAGE BAY RACK

MCI SPARE PARTS



100573 SPARE PARTS LIST			
LOCATIO	PART #	ITEM NAME	ITEM DESCRIPTION
1	100980	MCI Folding Bed Support Assy	Folding Support with Mounting Brackets and Hardware
2	100900	MCI Monorail Latch Sub Assembly	Latch Assembly Including Knob
3	100941	SPARES - MCI Knob Kit	Latch Knob with Mounting Hardware
4	101017	MCI Gas Spring	Gas Spring with Mounting Hardware
5	101079	Decal Kit MCI Luggage Bay Rack	Includes all Decals
6	101080	MCI and Universal Luggage Bay Rack Rail Latch Shoulder Screw	One Replacement Shoulder Screw for Rail Latch

BIKE RACK TRAILER

MAINTENANCE

- Washing - regular washing will enhance both the appearance of your trailer as well as keep the moving parts free of debris. We recommend spray or hand washing instead of automated washing systems due to possible interference with the brush rollers.

- ***Lubrication points***

Bikerack Hook Arms - Occasionally wipe the telescoping hook arms with silicon spray. At the same time, apply a light oil to all arm hinge joints.

Axle Wheel Bearings - Your axles are equipped with EZ lube fittings accessed directly through the rubber cover at the center of the hubs. Inject grease with a “flush” type (conical or needle) grease coupler. Use a No. 2 Lithium grease (or comparable) every 10,000 miles or twice per year.

Axle Torsion Arms - Do not require lubrication or maintenance.

- ***Tires & Wheels***

Tires - 6 ply Nylon chord, Load range E, 20.5 x 8.0 on 10 x 6 rims.

Tire Wear and Pressure - Check the tire air pressure daily. Adjust tire air pressure for smooth ride and to provide even tire wear across the face of the tire. Do not inflate tires to more than 90 psi.

Wheel Spacers - Spacers may be used to provide clearance between the tires and the spindle arms. These 5/16” spacer plates must be used when remounting wheels.

- ***Electrical***

Vehicle connection - See the “Towing” section of this manual.

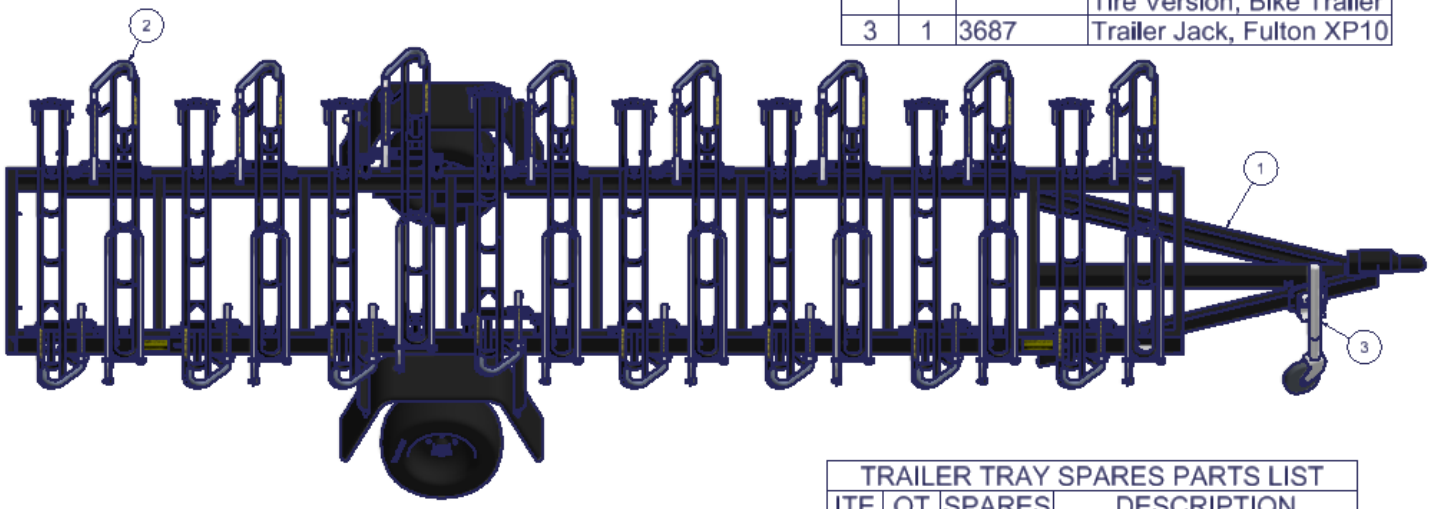
Lamps - CE 115 12 VDC Dual Element or 15” SlimLine LED. (Innovative Lighting Inc. P/N 250-4500)

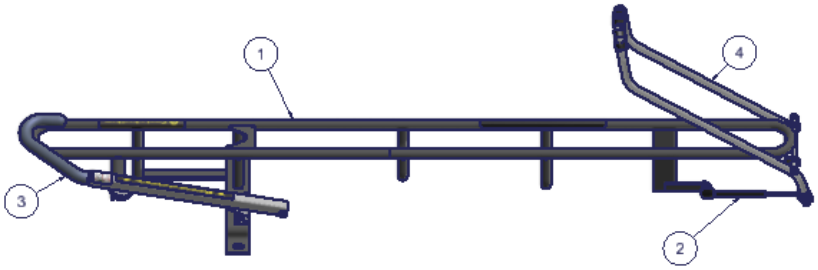
Troubleshooting - See electrical schematic, enclosed. Most lighting problems can be traced to either bad bulbs or faulty grounding connections. The lighting system is a “chassis ground” type, which uses the trailer frame as a ground conductor. The lamps ground to the frame through the lamp housing mounting screws. The Flat 4 plug ground connects to the frame through the white wire attached on the trailer tongue.

BIKE RACK TRAILER SPARE PARTS

Common spare parts are listed below. If replacement parts are needed and not shown below please contact Sportwork Sales Department.

TRAILER SPARES PARTS LIST			
ITE	QT	SPARES	DESCRIPTION
1	1	9250-BLK	Bike Trailer, 16 Bike Black
2	16	100528	Tray Sub Assembly w/Support Arms, Wide Tire Version, Bike Trailer
3	1	3687	Trailer Jack, Fulton XP10





TRAILER TRAY SPARES PARTS LIST			
ITE	QT	SPARES	DESCRIPTION
1	1	100828	SPARES - Bike Trailer Tray Assembly Replacement Sub Assembly, No Arms
2	1	100888	SPARES Spring Kit; Rear Arm; Bike Trailer
3	1	8542	PREBUILD SUPPORT ARM ASSEMBLY
4	1	8541	Rear Support Arm Assembly, Bike Trailer

TECHNICAL INFORMATION

Bicycle Dimensional Requirements For DL2, DL2 NP, DL3, V2, and V3 Bike-Racks-for Buses

	Minimum Requirement		Maximum Tolerance	
Wheel Diameter (as indicated on tire)	**DL2 and DL3** 20 inches	**V2 and V3** 16 inches	**DL2 and DL3** 27" prior mid 2006 current design 29" 700c	**V2 and V3** 29 inches 700c
Wheel Base (measured from ground contact point of front tire to ground contact point of rear tire)	No specified requirement		**DL2 and DL3** 44 inch wheel base	**V2 and V3** 46 inch wheel base
Tire Width (as indicated on tire)	No specified requirement		**DL2 and DL3** 2.35 inches	**V2 and V3** 3.00 inches
Weight	No specified requirement		Recommended gross bicycle weight not to exceed 55 pounds per loadable position.	
Overall Height	No specified requirement		No specified requirement	
Overall Width	No specified requirement		Racks w. panniers on the rear of bike can be 16" wide. 8" to either side.	

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Sportworks Technical Service Bulletin
Apex Bike Rack Support Arm Pin Replacement
Date 1/07/2015

Reason for Bulletin:

Apex Support Arm Clevis Pins may wear excessively in certain field environments. Excessive wear can lead to the pins failing.

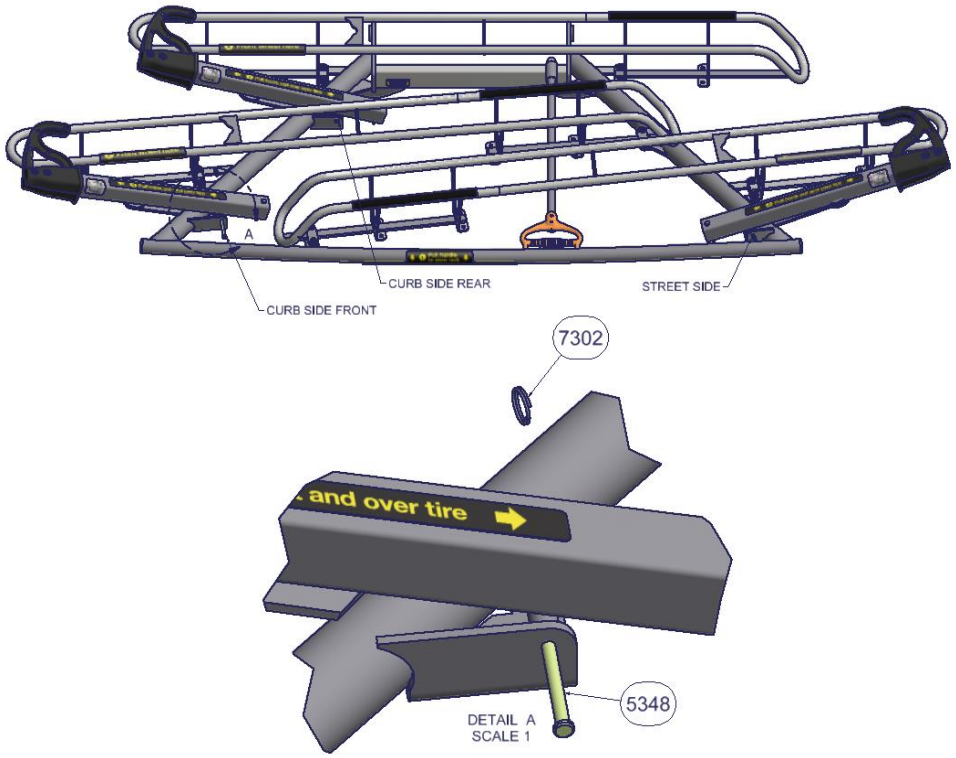
Suggested Service:

If excessive wear is evident within one year of use Sportworks recommends replacing the Support Arm Clevis Pin with harder replacement pin part number 5348.

Replacement Instructions: (May be accomplished with Rack installed on the Coach)

1. Use small wedge and rotate 7302 split ring to remove. Remove exiting Clevis pin. See Figure 1.
2. Install new 5348 Clevis Pin and Split Ring. Ensure that Split Ring is fully installed.
3. Verify that Support Arm rotates freely thru full range of motion.
4. Complete for all three Support Arms. Note: Support Arms should be re-installed in the original location.
5. Return all used Clevis Pins to Sportworks for Inspection.

FIGURE 1: Apex Bike Rack



Please notify your respective sales and support representative at Sportworks for any final questions and/or concerns.

Jerry Stewart
Vice President Engineering, Quality
Sportworks NW, Inc.

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Sportworks Product Change Notice
ECN 100902 Date 10/21/2014

P/N's Affected:
100902, SPARES - VeloPorter Wheel Tray, Six Bolt Version, drilled for Standard & Mirror has been replaced with 100822, SPARES - VeloPorter Wheel Tray, Four Bolt Version and 100823, SPARES - VeloPorter Mirror Wheel Tray, Four Bolt Version.

Figure 1:

100902 (6 Bolt) **100822 (4 Bolt)** **100823 (4 Bolt)**

Reason for Change:

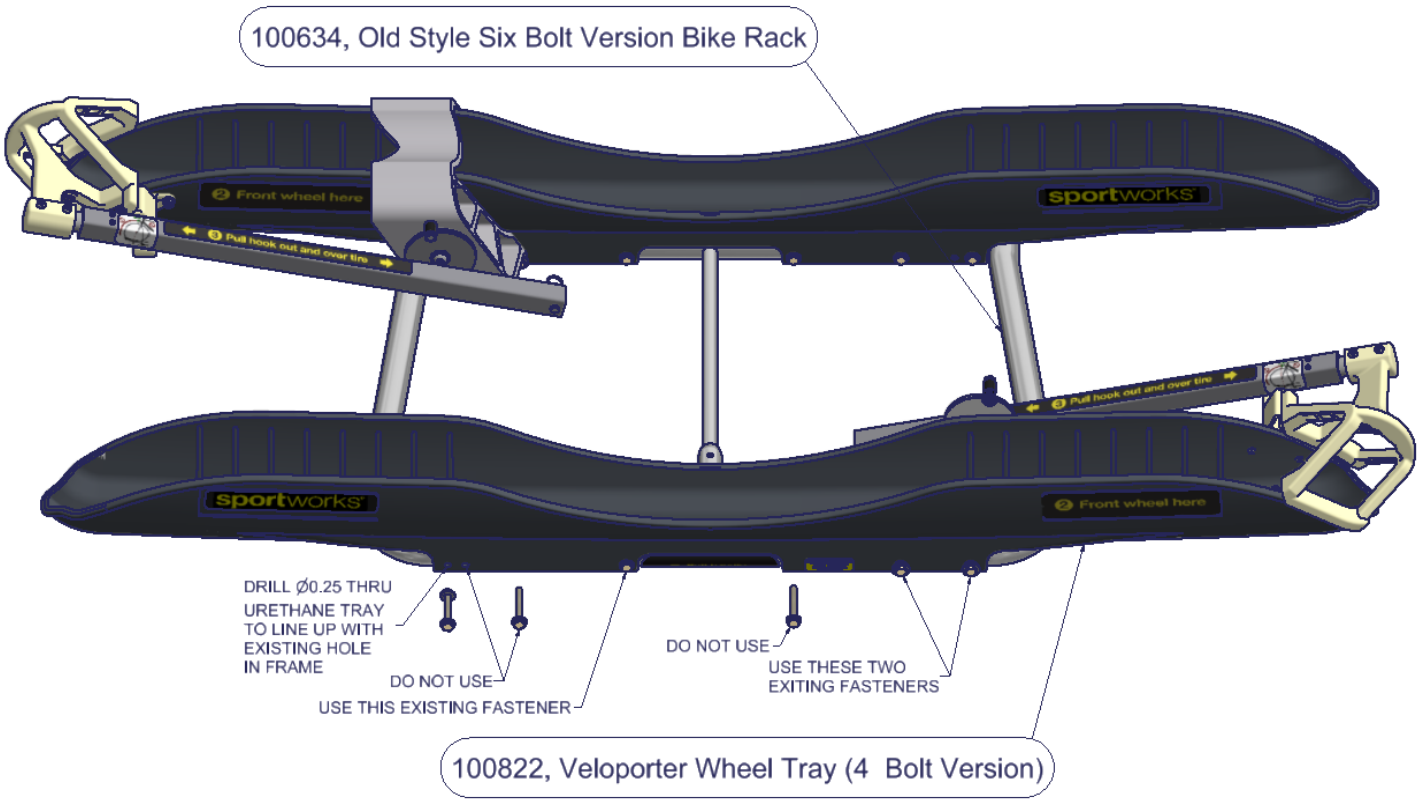
Veloporter 2 and Veloporter 3 Bike Racks were revised May 2009 to use four fasteners to attach the Tray to the Frame. Spares Part Number 100902 was created to provide a replacement Tray for the older frames. Usage of the 100902 has dropped to a level that does not make it practical to manufacture. The new four bolt Trays are the correct replacement tray for all Veloporters manufactured after May 2009 and can be easily modified in the field to fit an older six bolt Veloporter Frame, see Figure 2.

Description of Change:
100822 and 100823 replace 100902. The 100092 is a universal Tray with mounting holes for both standard and mirror positions for the Veloporter 3 Bike Rack. The replacements are drilled for either the standard position or the mirror position. Veloporter 2 only uses the standard position tray.

Change Type / Compatibility
100822 and 100823 are the correct replacement for current Veloporters and are easily modified to fit six bolt frames.

Changes Effective 10/20/2014
Open Orders for the 100902 must be revised to use either the 100822 or 100823.

Figure 2:



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Sportworks Product Change Notice
ECN Bike Rack Latch Handle Revision
Date 9/29/2014

Reason for Change:

The ergonomic black molded handle provides better gripping and use for the bicyclist. The revised design provides consistency across the Sportworks line of bike racks and is more efficient to manufacture and assemble. Replacement in the field is also easier. The new Handle is 100% made in USA.

Description of Change:

Latch Handle has been revised from a welded design to be an assembly using the ergonomic black molded handle.

DL2, ***NP and Trilogy Old and New***

Recessed Bumper Style Old and New

Short and Wide Recessed Style Old and New

Photograph of the Old and New 100180 DL2

Products and Base Part Numbers Affected:
All DL2 Bike Rack Models: (100336, 100352, 100512, 100536, 100982)
All NP Bike Rack Models: (100434, 100460, 100540, Spares 100180)
All Trilogy Bike Rack Models: (100546, 100567, Spares 100598)
All Two Position, Three Position, Short and Wide Recessed Bumper Bike Rack Models: (100631, 100635, 100648, 100649, 100806, 101077, 101087, 101097, 101104, Spares 100690)

New Bike Racks for the models listed above will be revised to use the new Latch Handle Assemblies. The following Spare Parts Kits for the old style Latch Handle will still be available:

100180, SPARES - DL2 Latch Handle with Roll Pin174033
100598, SPARES - Trilogy Latch Handle, Bead Blast Finish
100690, SPARES - Latch Handle, Recessed Bumper Bike Rack, Bead Blast Finish

New Spare Parts Kits with the New Latch Handle have been created. Additional Kits will be created upon request:

101121, SPARES - Trilogy Latch Handle, Molded Handle
101122, SPARES - DL2 Latch Handle, Molded Handle
101123, SPARES - 2 Postion Wide Recessed Latch Handle, Molded Handle

Change Type / Compatibility
The new Latch Handles are completely interchangeable with the previous version. All existing Latch Handles can be used as spare parts for new version Bike Racks.

Change Effectivity
As of 11/1/14, the following racks will be shipping with the new latch handle:

As of 11/1/14 shipments for DL2, NP and Trilogy Bike Racks will include the New Latch Handle
As of 12/1/14 shipments for the Recessed Style Bikes Racks will include the New Latch Handle

Please notify your respective sales and support representative at Sportworks for any final questions and/or concerns.

Jerry Stewart
Vice President Engineering, Quality
Sportworks NW, Inc.

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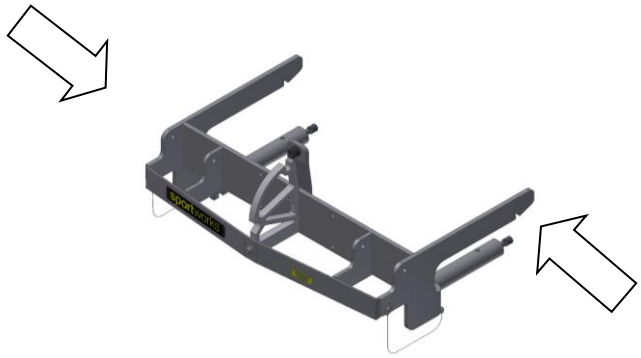
Sportworks Product Change Notice
ECN 101075 Date 9/05/2013

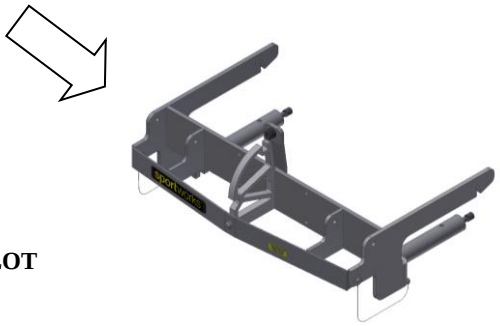
P/N's Affected:
100626, Ten Second Bracket, Slide In 11.0, NP Tabs has been replaced with 101075, Ten Second Bracket, Universal 11.0, NP Tabs for use on a Romeo Rim Universal Bumper. There has been no change to the Romeo Rim Bumper.

100626



SLOT

101075



Reason for Change:

The 100626 was designed to fit the Romeo Slide in Bumper and the slot width does not provide sufficient clearance with the Universal bumper back structure for easy installation. The slot width has been increased 0.027" on the 101075 making installation easier. Once installed both brackets will function and perform indentically.

Description of Change:
A new P/N has been created for the Ten Second Bracket designed to fit the Romeo Universal Bumper.

Change Type / Compatibility

1. 100626 Ten Second Brackets already installed will perform as intended and do not need to be replaced or returned.
2. 101075 Part Number will be used for all future deliveries of Ten Second Brackets installed onto the Universal Bumper and is backward compatible with all Universal Bumpers.

Changes Effective 9/05/2013
Open Orders for the Ten Second Bracket used on Universal Bumpers shall be revised to use the 101075 part number. Please update your internal Ordering Systems to reflect the new part number.

Jerry Stewart
Vice President Engineering, Quality
Sportworks NW, Inc.

Support Arm Magnet Change Notice
Date 11/19/2012

Notification of Change:
All support arm magnets used in the DL2 and DL3 bike racks and spare parts will be changed from silicone filled to a Stainless cover effective November 21, 2012.

Reason for Change:
The new magnet design features a stainless cover over the magnet. The new magnet assembly has improved durability, appearance, and retention strength. The magnet dimensions and mounting method are unchanged.

Part Numbers Affected by Change:
All mild and stainless steel DL2 and DL3 part numbers and the associated Spare Magnet Kits will be affected by this change.
This includes part numbers:
100116, 100336, 100352, 100434, 100460, 100512, 100536, 100540, 100546, 100567, 100631, 100635, 100648, 100649, 100663, 100805, 100806, 100912, 100982 and ALL associated product variations.

Change Type/Compatibility:

- The new magnet is interchangeable with the old magnet.

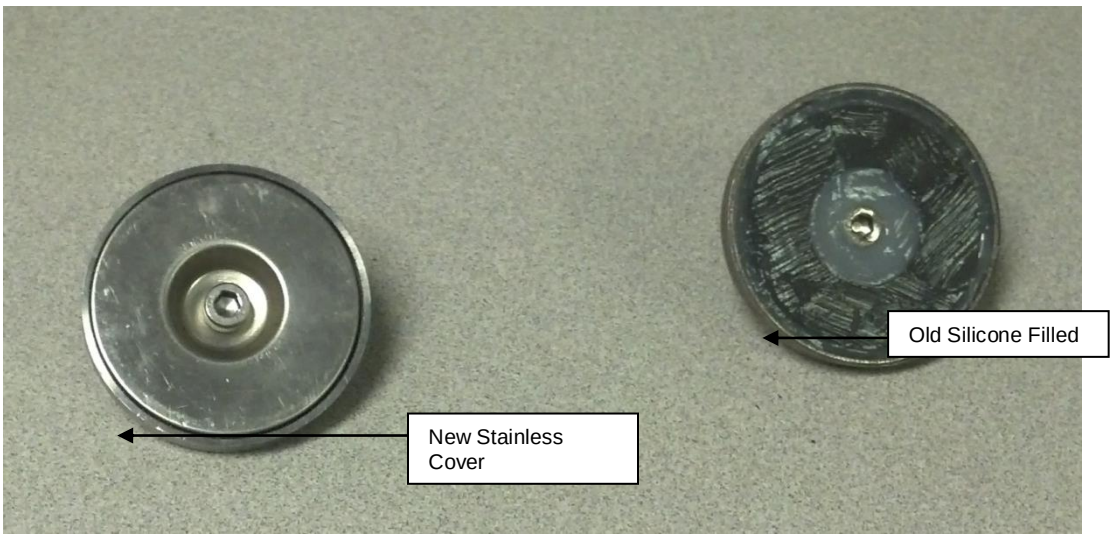


Figure 1. Comparison of new magnet and old magnet.

This is an informational notification only, there is no customer action required.

Jacob Ellul-Blake
Design Engineer
Sportworks NW, Inc.

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Sportworks Customer Change Notice
CCN100352 Date 11/30/2010

Effective January 1, 2011, Sportworks will replace mild steel, black powder coated support arm housings with an all stainless steel, anti-glare finish support arm housing for all new racks and spare part orders.

Reason for Change:

1. This change will improve product performance and eliminate potential rusting on the magnet arm catch.
2. This change simplifies replacement parts. There will now be one main replacement support arm housing and one main replacement support arm assembly part number to order.
3. This provides arm housing consistency across our product line on our all stainless steel and mild steel, powder coated rack offerings.

Description of Change:

1. This change will replace mild steel, black powder coated support arm housing assemblies with stainless steel, anti-glare finish support arm housing assemblies.
2. This change will phase out our mild steel, black powder coated support arm assemblies and support arm housing spares, upgrading to the all stainless steel, anti-glare finished version.

Change Type / Compatibility

Class B Change – New revision is backward compatible and adds increased functionality for future orders.

Effectivity of Change:

1. This change will be effective on all new bike rack assemblies for all deliveries after **1/1/2011.**
2. Existing spares part numbers for the black powder coated support arm housings will be phased out **6/31/2012.** Customers are strongly encouraged to fully migrate to the stainless steel, anti-glare finish support arm housings prior to the June 2012 date. Refer to support arm spares table for the proper part numbers to order.

Jerry Stewart
Vice President Engineering, Quality
Sportworks NW, Inc.

Rack Assembly Part Numbers Affected		
Part Number	Description	Replacement Part Number
100352	DL2 Bike Rack - Black	N/A
100352-DPLY	DL2 Bike Rack w/ Deployment Kit - Black	N/A
100352-SPAN	DL2 Bike Rack w/ Bilingual Decals - Black	N/A
100352-SPAN-ID	DL2 Bike Rack w/ Bilingual Decals and ID Tag - Black	N/A
100352-SPAN-QR	DL2 Bike Rack w/ Bilingual Decals and Quick Release Hardware - Black	N/A
100352-DPLY-QR	DL2 Bike Rack w/ Deployment Kit, w/ Quick Release Hardware - Black	N/A
100352-qr	DL2 Bike Rack w/ Quick Release Hardware - Black	N/A
100434	NP DL2 Bike Rack - Black	N/A
100434-SPAN	NP DL2 Bike Rack w/ Bilingual Decals - Black	N/A
100434-SPAN-QR	NP DL2 Bike Rack w/ Bilingual Decals and Quick Release Hardware - Black	N/A
100434-SPAN-QR-DPLY	NP DL2 Bike Rack w/ Bilingual Decals, Quick Release Hardware, and Deployment Kit - Black	N/A
100434-DPLY	NP DL2 Bike Rack w/ Deployment Kit - Black	N/A
100434-DPLY-SPAN	NP DL2 Bike Rack w/ Deployment Kit, Bilingual Decals - Black	N/A
100434-DPLY-QR	NP DL2 Bike Rack w/ Deployment Kit, Quick Release Hardware - Black	N/A
100434-QR	NP DL2 Bike Rack w/ Quick Release Hardware - Black	N/A
100434-FRNCH	NP DL2 Bike Rack, French-English Decals, Black	N/A
100434-FRNCH-DPLY	NP DL2 Bike Rack, French-English Decals, Deployment Kit - Black	N/A

Support Arm Spares Part Numbers Affected		
Part Number	Description	Replacement Part Number
100111	SPARES - Support Arm Housing - Black	100594
100308	SPARES - MIRRORED Hook Supp Arm Assy - Black	100322
100109	SPARES - Support Arm Assembly - Black	100588
100109-SPAN	SPARES - Support Arm Assembly, Bilingual Decals - Black	100588-SPAN
100594	SPARES - Support Arm Housing, SS NP, DL2 and Middle Position Trilogy	No Change
100322	SPARES - MIRRORED Hook Support Arm Assembly - All S/S	No Change
100588	SPARES - Support Arm Assembly DL2, DL3 Middle Pos., SS Anti-Glare	No Change
100588-SPAN	SPARES - Support Arm Assembly DL2, DL3 Middle Pos, SS Anti Glare, Bilingual Decals	No Change

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MMT Deployment Kit Connector Change Notice
Date 09/01/2010

Notification of Change:
All deployment kit connectors used in Sportworks Pivot Plate assemblies (part numbers listed below) are being replaced with their respective Weather Pack connector counterparts beginning September 1, 2010.
Reason for Change:
The Weather Pack connectors provide improved protection from the environment and corrosion versus the original molded style connector currently being used.

Table 1. Deployment Kit Part Numbers Affected by Change to Weather Pack Connectors:

Item ID	Item Name
100502	SPARES - Deployment Pivot Plate Kit, with Standoffs
100584	Deployment Kit, DL2 & DL3 ONLY Complete
100462	Deployment Kit with light & faceplate & Sheet Metal Bracket, Old Quadrants
100718	V2 Deployment Alarm Kit, Complete
100720	Deployment Kit, V2 & V3 Complete
100440-DPLY-WPK	Pivot Plate Assy, Std & NP Width, Nova BUS Low Floor, Black, w/travel stop, Deploy Switch w/wpk con
100517-MAG-ND	NP Pivot Plate Assembly, Deployment Switch, No Decals, Black
100530-DPLY	Pivot Plate Assembly, Formed Plate, Std Width,14, 16, 18, Deployment Kit, Black
100530-WHT-DPLY	Pivot Plate Assembly, Formed Plate, Std Width, 14, 16, 18, Deployment Kit, White
100530-Mag	Pivot Plate Assembly, Formed Plate, Std Width, 14, 16, 18, Magnetic Deployment Switch
100530-MAG-ND	Pivot Plate Assembly, Formed Plate, Std Width, 14, 16, 18, Magnetic Deployment Switch, No decal
100517-mag	NP Pivot Plate Assembly, Magnetic Deployment Switch, Black
100517-DPLY	Pivot Plate Assy, NP Width, 14", 18" Ctrs, New Wash Guard, Deployment Kit, Black
100630-DPLY	Pivot Plate Assembly with hardware, recessed bumper, Deployment Kit
100386-DPLY	Pivot Plate Assy, , Std Width, 23 Ctrs, Travel Stop, Deployment Switch, Black
100491-DPLY	Pivot Plate Assy, Std Width, ETI Bus, O/S (11/16) Holes, w/Deployment Switch
100637-DPLY	Ten Second Bracket, Swept, 10.0, Deployment Kit w/o Cable, See LD
100641-DPLY	Ten Sec Brkt, Swept 10.0", w/NP Tabs, Dply Kit w/o Cable
100654	Deployment Kit Hardware, Recessed Bumper Pivot Plate
100682	Deployment Kit Hardware Complete, Recessed Bumper Style
100616-DPLY	PIVOT PLATE Chevy 5500, Std and NP Width, Deployment Kit
100679	Deployment Rework Kit, New Flyer
100680	Deployment Kit, New Flyer Trolley
100681	Deployment Magnet Switch with Fasteners, New Flyer Trolley
100737-DPLY	Ford, 2001-2010 E350/450 Vented Mounting Plate Assy, Deployment Kit, Black
100626-DPLY	Ten Second Bracket, Slide In 11.0, NP Compatible, Deployment Kit w/o Cable, See LID
100668-DPLY	Ten Second Bracket, Swept, 12.0, NP Tabs, Deployment Kit w/o Cable, See LID

Change Type/Compatibility:

- The new magnet switches will not fit prior Sportworks cable wiring containing the original-style molded connector.
- These Deployment kit connector changes will be transparent to you when ordered as a complete kit.

Effectively of Change:

1. All deployment kit shipments on or after September 1, 2010 will contain our new Weather Pack connectors only.
2. A limited quantity of spares inventory will be maintained by Sportworks for instances where the original molded style connector is required to support existing deployment kit maintenance.

Service Part Number Reference Table:
The spares kits containing the original molded style connector will remain available for repair or replacement. Three new Part Numbers have been created for new spares kits constructed with the new Weather Pack connectors only.

Table 2. Deployment Wiring Spares Definition

Old Molded Style Connector Spare		New Weather Pack Connector Spare	
100853	SPARES, CABLE, 9' with Original Molded Connector, 22 ga 2 conductor	**100887**	SPARES, CABLE, 9' with Weather Pack Connector 1-End, 20AWG, 2 Conductor
100832	SPARES - Magnetic Switch with Original Molded Connector and Fasten	**100885**	SPARES - Magnetic Switch with Weather Pack Connector - Standard, and Fasteners
100670	Deployment Switch Cable with Origina style Molded connector and Weather Pack Connector, 7' length	**100886**	Deployment Cable, 20 ga 2 conductor with Weather Pack Connectors Pin and Socket, 7' Length

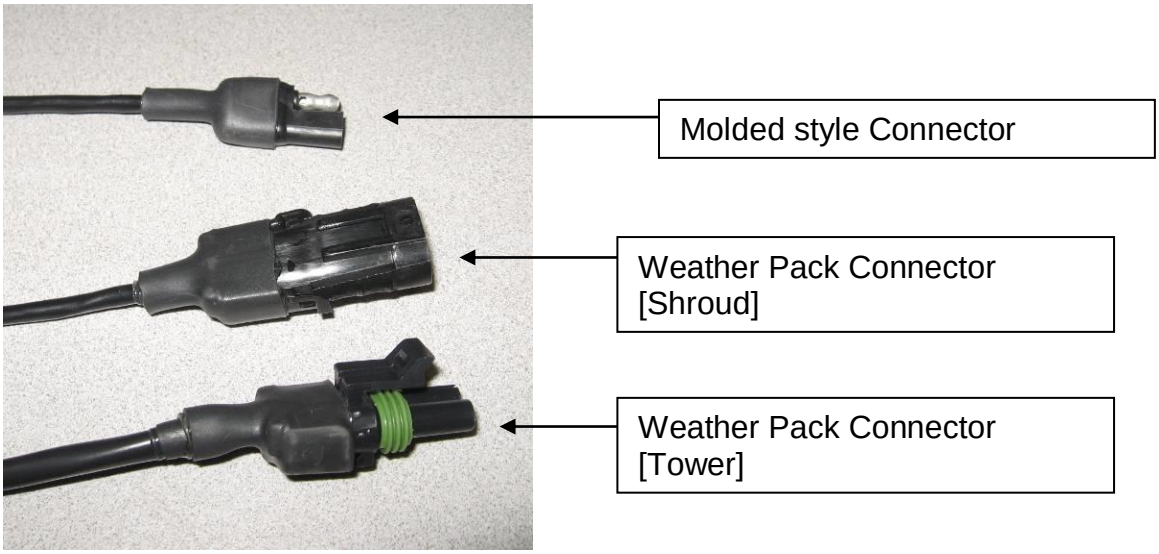


Figure 1. Comparison of original molded connector (top) and new Weather Pack connectors.

Aaron Rozeboom
Design Engineer
Sportworks NW, Inc.

TECHNICAL BULLETIN 102

To: OEM / Transit Customers

From: Sportworks Northwest, Inc.

RE: 3-Position Racks & Small Transit Vehicles

Models: Trilogy Bicycle Racks – Item ID 100546 / 100567 / 100648 and VeloPorter 3 Bicycle Racks – Item ID 100659

Issue Date: February 17, 2010

Dear Customers and Resellers,

Sportworks has received an increased number of customer inquiries regarding the use of 3-position bike racks on smaller-sized transit vehicles. While we cannot control how customers decide to install and use our products in the field, there are some important **safety** and **warranty** issues to consider when choosing to install 3-positions racks on smaller bus types built on truck chassis, which may include but are not limited to cut-aways, shuttles and paratransit vehicles.

Sportworks recommends the use of 3-position bike racks on full size 96” and 102” wide transit vehicles only. Using 3-position racks on smaller buses and buses built on truck chassis may create unsafe conditions for cyclists and vehicle operators, and may void the products limited 1-year warranty. The following concerns can be directly attributed to the narrow profile, small truck chassis and stiff suspension commonly found in cut away, shuttle and paratransit type vehicles.

- Users standing in or near a lane of moving traffic when loading/unloading bikes
- Headlight and turn signal blockage
- A wider than normal turn-radius may be required to safely maneuver the vehicle
- Rack damage (including breakage) caused by excessive vibration and undue stress on the critical weld points

For additional information and to learn more about the rack models Sportworks recommends for use with smaller transit vehicles, please contact our Sales and Support Department at (425) 483-7000 or salesandsupport@sportworks.com.

Thank You,

Sportworks Northwest, Inc.

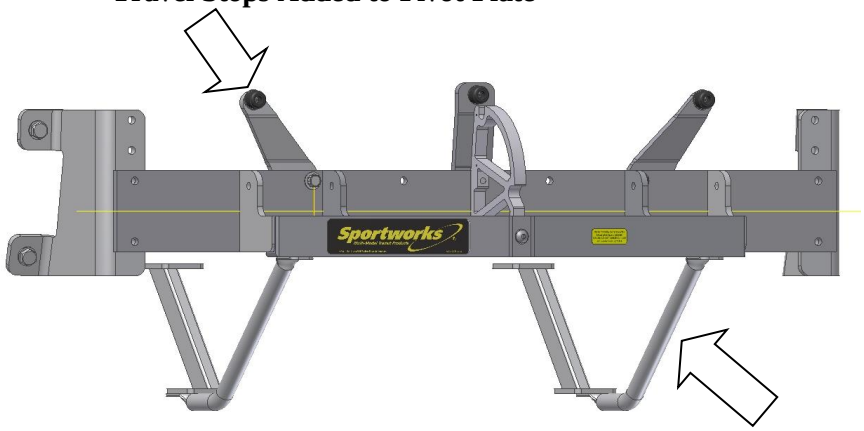
Sportworks Product Change Notice

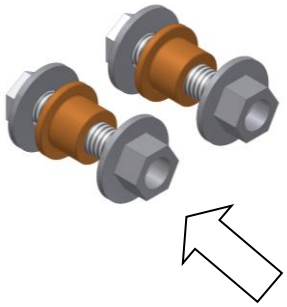
ECN 100616 Date 2/25/10

P/N's Affected:

Item ID	Item Name	2011 Price
100615	BRACKET, Chevy 5500 (includes 2)	$130.00
100616	PIVOT PLATE Chevy 5500, Std and NP Width	$163.00
100616-DPLY	PIVOT PLATE Chevy 5500, Std and NP Width, Deployment Kit	$232.00
100846	**New** - Strut Kit, Chevy 5500 – required as of 2/25/2010	$ 78.00
100839	**New** - Heavy Duty Pivot Bolt Kit, (installs one rack) – Recommended	$ 26.00

Travel Stops Added to Pivot Plate





Reason for Change: **100846 New Strut Kit** **100839 Pivot Bolt Kit**

Firm Suspension of the Chevy 5500 Chassis combined with flexible bumper mount and flexible Pivot Plate results in excessive bouncing of the Sportworks Bike Rack in both the stowed and deployed position leading to premature failures of rack bushings and frame.

1. Excessive bouncing may dislodge bicycle.

Description of Change:

1. Two additional Travel Stops have been **added to the 100616 Pivot Plate**.
2. **100846 Strut Kit has been created** to increase rigidity of the installation. The Kit mounts to existing chassis plates.
3. **100839 - Heavy Duty Pivot Bolt Kit** has been created to address extended bushing life.

Change Type / Compatibility

3. All new Pivot Plates include the additional Travel Stops.

4. Field installation to older Pivot Plates is possible but requires drilling four mounting holes in the Pivot Plate. Use Kit P/N 100818.
5. All new Chevy 5500 Installations will be required to use the new 100846 Strut Kit. Field Installation to older Pivot Plates is possible but requires drilling two mounting holes thru Pivot Plate Wash Guard.

Changes Effective 2/25/2010:

1. 100616 and 100616-dply include travel stops for additional stability.
2. New part 100846 is a required part to be ordered with 100616 and 100616-dply to assist with rigidity of installation.
3. 100839 Heavy duty bolt kit is recommended to extend bushing life.
4. Full pivot plate assembly will now require part numbers 100615, 100616 or 100616-dply and 100846 with recommended 100839, Heavy Duty Pivot Bolt Kit.

Please update your internal Ordering Systems to reflect these new parts and associated pricing.

Jerry Stewart,
Vice President Engineering, Quality
Sportworks NW, Inc

VeloPorter 3 Product Change Notice
ECN 100659-H Date 5/11/09

Parts Affected:

Item ID	Item Name
100659-SPAN-SP	VeloPorter 3 Bike Rack
100659-SPAN-DPLY	VeloPorter 3 Bike Rack
100659-DPLY-SP	VeloPorter 3 Bike Rack
100659-DPLY	VeloPorter 3 Bike Rack
100659	VeloPorter 3 Bike Rack
100659-SPAN-SPR	VeloPorter 3 Bike Rack
100659-SPAN-DPLY-	VeloPorter 3 Bike Rack
100659-SAMPLE	VeloPorter 3 Bike Rack
100659-SP	VeloPorter 3 Bike Rack
100740-DPLY	Custom VeloPorter Bike Rack (Wide Frame
100740-TRDPLY-SP	Custom VeloPorter Bike Rack (Wide Frame
100740	Custom VeloPorter Bike Rack (Wide Frame
100740-TRDPLY	Custom VeloPorter Bike Rack (Wide Frame

Reason for Change:
To allow easier field replacement of urethane trays

Description of Change:
Replaced Phillips Head Fasteners with Hex Head and reduced the number of fasteners per tray from six to four.

Change Type/Compatibility:
Class A Change – New Trays and Frames will not fit previous versions of Trays and Frames. Installation with Pivot Plate remains unchanged.

Effectivity of Change:

1. All Shipments on or after May 1, 2009. First shipments may include both six bolt and four bolt versions

Tray Mounting Fasteners

Service Part Number Reference Table:
Six Bolt Trays will continue to be available for repair or replacement. Two new FGI Part Numbers have been created for the new four bolt trays. All other hardware including Torsion Spring Pads and Deployment Kit Brackets have been modified to fit both four and six bolt frames.

Item ID	Item Name
100701	VeloPorter Wheel Tray, Six Bolt Version
100702	VeloPorter Mirror Wheel Tray, Six Bolt Version
100822	VeloPorter Wheel Tray, Four Bolt Version
100823	VeloPorter Mirror Wheel Tray, Four Bolt

Jerry Stewart
Vice President, Engineering & Quality
Sportworks Northwest, Inc.

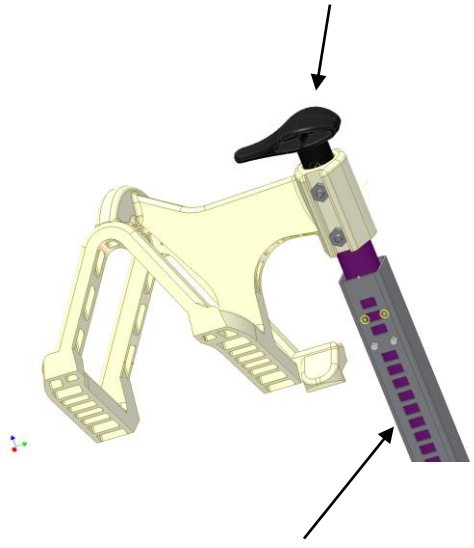
VeloPorter 3 Product Change Notice
ECN 100659-G
December 12, 2008

Parts Affected:

Sportworks P/N	Item Type
100659-SPAN-SP	VeloPorter 3 Bike Rack
100659-SPAN-DPLY	VeloPorter 3 Bike Rack
100659-DPLY-SP	VeloPorter 3 Bike Rack
100659-DPLY	VeloPorter 3 Bike Rack
100659	VeloPorter 3 Bike Rack
100659-SPAN-SPR	VeloPorter 3 Bike Rack
100659-SPAN-DPLY-	VeloPorter 3 Bike Rack
100659-SAMPLE	VeloPorter 3 Bike Rack
100659-SP	VeloPorter 3 Bike Rack
100740-DPLY	Custom VeloPorter Bike Rack (Wide Frame
100740-TRDPLY-SP	Custom VeloPorter Bike Rack (Wide Frame
100740	Custom VeloPorter Bike Rack (Wide Frame
100740-TRDPLY	Custom VeloPorter Bike Rack (Wide Frame

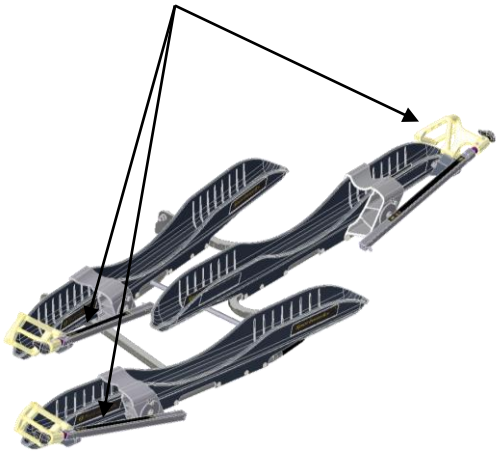
Description of Change:
All VeloPorter 3 support arms have been revised to include a ratchet system (secondary retainment device) that significantly improves field performance. Sportworks highly recommends updating all VeloPorter 3 bike racks affected by this change. *Note: This product change does not apply to VeloPorter 2 bike racks and support arms.*

NEW Ratchet System Release Handle



NEW Ratchet System

VeloPorter 3 Support Arms



Reason for Change:
To increase bicycle retention on VeloPorter 3 and custom VeloPorter bike racks.

Date of Change:
All VeloPorter 3 Bike Racks delivered after May 1, 2008 include the new ratchet support arm features installed by the manufacturer prior to shipment. All VeloPorter 3 Bike Racks delivered on or before April 30, 2008 will require field replacement to obtain the new ratchet support arm features. Field replacement will be offered directly to all VeloPorter 3 end-customers in accordance with Sportworks VeloPorter 3 Field Replacement Program.

Field Replacement Program (FRP):
As a courtesy to our VeloPorter 3 end-customers, Sportworks will rework and replace all VeloPorter 3 support arms purchased and delivered prior to May 1, 2008 at no charge. For additional information about this program including a copy of the Customer Agreement, please contact:

Beata Zayas
FRP Primary Contact
(425) 483-7000 x12
beataz@sportworks.com

Kat Anthony
FRP Support
(425) 483-7000 x29
kathya@sportworks.com

Replacement P/N Cross Reference Table:
All old P/N's mentioned below have been discontinued and are no longer available.

Old P/N	Description	New P/N	Description
100676	VeloPorter Support Arm Assy	100778	VeloPorter Ratchet Support Arm Assembly
100699	VeloPorter Support Arm Grip	100779	VeloPorter Ratchet Support Arm Grip
100696	VeloPorter Mir Supt Arm Assy	100776	VeloPorter Mirror Ratchet Support Arm Assembly
100700	VeloPorter Mir Supt Arm Grip	100777	VeloPorter Mirror Ratchet Support Arm Grip
	Replacement Kit (3 arms)	100799	V3 Rework Support Arm Set
	Replacement Kit (2 arms)	100803	V3 Custom Wide Frame Rework Support Arm Set

Required Actions:
1. Please update your ERP and other ordering systems to reflect the new VeloPorter 3 P/N's provided above.
2. Please contact us to receive a copy of the FRP Customer Agreement, and to learn how to receive replacement VeloPorter 3 support arms with ratchet system through our Field Replacement Program.

Regards,

Jerry Stewart
Vice President, Engineering & Quality
Sportworks Northwest, Inc.

Product Change Notice:

Discontinuation of Electro-Polished Bike Racks

Date of Notice: November 7, 2008

Description of Change:

All Sportworks bicycle racks and related spare/replacement parts currently available with an electro-polished finish (glossed silver color) will be discontinued effective January 01, 2009, and replaced with the anti-glare finish (matted silver color).

Reason for Change:

The electro-polish process uses toxic and environmentally hazardous chemicals that are difficult to handle and increasingly expensive to manufacture.

Change Type / Compatibility:

Class A Change - All existing electro-polished P/N's will be replaced with equivalent anti-glare P/N's (see Table 1.0). The anti-glare P/N's will be available with the same features, kits and options as the existing electro-polished product line.

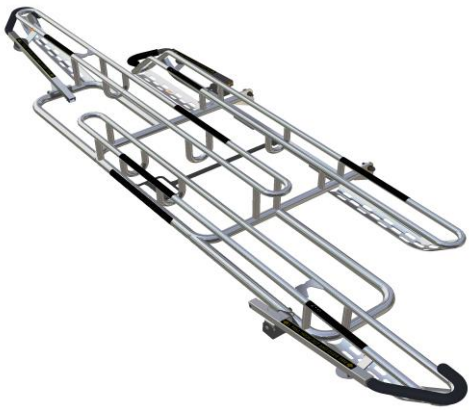
Effectivity of Change:

Orders for electro-polished products will be accepted and processed through December 31, 2008 in accordance with Sportworks annual pricing policy. Orders for electro-polished products received on or after January 1, 2009 will not be accepted.

Required Actions:

Customers and OEM resellers are required to update their procurement systems and documentation to reflect the conversion from electro-polished to anti-glare P/N's as outlined in Table 1.0 below.

DL2 & DL2 NP



TRILOGY

Table 1.0 – Electro-Polished to Anti-Glare P/N Conversion Chart

Electro-Polish P/N's	Electro-Polish Item Description	NEW Anti-Glare P/N's
100306	S/S DL2 Santa Cruz – Electropolished	100804
100306-DPLY	S/S DL2 Santa Cruz – Electropolished, w/Deployment Switch	100804-DPLY
100307	S/S DL2 Santa Cruz Body Only, Electropolished	100808
100460	S/S NP Bike Rack – Electropolished	100540
100460-16	S/S NP DL2 Bike Rack w/ Extended Reach Support Arm – Electropolished	100540-16
100460-DPLY	S/S NP DL2 Bike Rack w/ Deployment Kit – Electropolished	100540-DPLY
100460-DPLY-QR	S/S NP DL2 Bike Rack w/ Deployment Kit, Quick Release Hardware – Electropolished	100540-DPLY-QR
100460-dply-qr-span	S/S NP DL2 Bike Rack w/ Deployment Kit, Quick Release Hardware, Bilingual Decals – Electropolished	100540-dply-qr-span
100460-DPLY-SPAN	S/S NP DL2 Bike Rack w/ Deployment Kit, Bilingual Decals – Electropolished	100540-DPLY-SPAN
100460-Frnch	S/S NP DL2 Bike Rack, French Decals – Electropolished	100540-Frnch
100460-QR	S/S NP DL2 Bike Rack w/ Quick Release Hardware – Electropolished	100540-QR
100460-SPAN	S/S NP DL2 Bike Rack w/ Bilingual Decals – Electropolished	100540-SPAN
100460-trdply	S/S NP DL2 Bike Rack w/ Trolly Deployment Kit – Electropolished	100540-trdply
100461	S/S DL2 NP w/ 4 loop supports body only, Electropolished	100809
100512	S/S DL2 Bike Rack Stainless Steel – Electropolished	100536
100512-DPLY	S/S DL2 Bike Rack Stainless Steel w/ Deployment Kit - Electropolished	100536-DPLY
100512-dply-qr	S/S DL2 Bike Rack Stainless Steel w/ Deployment Kit, w/ Quick Release HW -Electropolished	100536-dply-qr
100512-QR	S/S DL2 Bike Rack Stainless Steel w/ Quick Release Hardware - Electropolished	100536-QR
100512-SPAN	S/S DL2 Bike Rack Stainless Steel w/ Bilingual Decals - Electropolished	100536-SPAN
100512-TRDPLY	S/S DL2 Bike Rack Stainless Steel w/ Trolley Deployment Kit - Electropolished	100536-TRDPLY
100550	S/S DL2 w/ 4 loop supports, Van Hool, Electro Polish	100805
100638-DPLY	DL2 Bike Rack, SS, Recessed Bumper , Electropolished, dply	100806-DPLY

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